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List of *Culicoides* biting midges (Diptera: Ceratopogonidae) from the state of Amazonas, Brazil, including new records

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Abstract: *Culicoides* are vectors of pathogenic agents that infect humans and other animals. Here, we provide a list of *Culicoides* from the state of Amazonas and also document new records from Presidente Figueiredo Municipality, Amazonas, Brazil. We provide a map of recorded species and a wing atlas for identification. The *Culicoides* fauna of Amazonas is now known to include 89 known species that belong to seven subgenera, 10 informal species groups, and one ungrouped species. We record nine species of *Culicoides* (*C. aldomari*, *C. batesi*, *C. brownie*, *C. flavivenulus*, *C. franklini*, *C. guamai*, *C. paramaruim*, *C. pusilloides* and *C. tidwelli)* for the first time from Amazonas state. *Culicoides brownie* and *C. tidwelli* are reported for the first time from Brazil.

Key words: biodiversity, culicomorpha, hematophagous insects, Amazon Basin

INTRODUCTION

Culicoides Latreille, 1809, or biting midges, are known vectors of pathogenic nematodes, protozoa, and viruses that cause infection in humans and other animals. In addition to their vectorial importance, these midges are pernicious due to their bites (Mellor et al. 2000). There are 1,355 species described worldwide (Borkent 2015); 116 species inhabit Brazil and 80 have been recorded in the state of Amazonas (Farias et al. 2016; Santarém and Felippe-Bauer 2016). A survey conducted in Presidente Figueiredo Municipality recorded species previously unknown in the state of Amazonas. Here, we revise the list *Culicoides* species occurring in Amazonas state and record the nine new species records for the state, and two new records for Brazil.

MATERIAL AND METHODS

We compiled a list of *Culicoides* species (Table 1), and mapped each species in Amazonas state, based on Borkent and Spinelli (2007), Farias et al. (2016), Castellón and Felippe-Bauer (2015), and Santarém and Felippe-Bauer (2016). The municipalities in Amazonas state where there are records of *Culicoides* are mapped in Figure 1. We collected additional records during an entomological study in a rural settlement of Rio Pardo, Presidente Figueiredo Municipality, Amazonas, Brazil. This survey was carried out between June and August 2010, using CDC light traps in forest fragments and peridomicilies (shelters for domestic animals and cultivation). Specimens of *Culicoides* were preserved in 70% ethanol, dissected, and slide-mounted in Canada balsam using the techniques described by Wirth and Marston (1968). We identified our specimens using various identification keys, as follows: Wirth and Blanton (1959); Spinelli et al. (1993); Felippe-Bauer et al. (2013); and Santarém et al. (2015). Subgeneric classification of *Culicoides* species was based on Borkent and Spinelli (2007) and Borkent (2015). Some voucher specimens are deposited at the Laboratory of Infectious Disease Ecology in Amazon (ILMD/FIOCRUZ, Amazônia; Table 1). Microphotographs of the wings were obtained using a digital system adapted to an optical microscope with a digital camera.

RESULTS

The *Culicoides* fauna of Amazonas state is comprised of 89 species belonging to seven subgenera, 10 informal species groups, and one ungrouped species (Table 1). In our study, *C. brownei* Spinelli, 1993 and *C. tidwelli* Spinelli, 1993 are recorded for the first time in Brazil. Another seven species were found for the first time in Amazonas state, as follows: *C. aldomari* Felippe-Bauer & Trindade, 2013; *C. batesi* Wirth & Blanton, 1973; *C. flavivenulus* Costa Lima, 1937; *C. franklini* Spinelli, Greiner & Wirth, 1993; *C. guamai* Wirth & Blanton, 1973; *C.*

Table 1. *Culicoides* species recorded to Amazonas state, Brazil.

Subgenus/group	Species	Municipalities /Coordinates	Voucher number
Anilomyia / covagarciai	*Culicoides efferus*	Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W)	***
Avaritia	*C. pusilloides**	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-8
	C. pusillus	Manacapuru (03°23′46.71″ S, 060°37′56.84″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), Santa Isabel do Rio Negro (00°24′49.74″ S, 65°01′00.60″ W)	0001-10
Diphaomyia	*C. freitasi*	Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W)	***
Haematomyidium	*C. crucifer*	Manaus (03° 5′39.60″ S, 059°59′14.09″ W)	***
	C. debilipalpis	Coari (04°10′50.95″ S, 063°09′30.77″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W), Novo Airão (02°42′43.17″ S, 060°56′48.13″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W), Santa Isabel do Rio Negro (00°24′49.74″ S, 065°01′00.60″ W)	0001-11
	C. denisae	Manaus (03°03′00.97″ S, 060°01′29.92″ W)	***
	C. glabrior	Coari (04°10′50.95″ S, 063°09′30.77″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), Tefé (03°21′05″ S, 064°42′53″ W)	0001-12
	C. hoffmani	***	***
	C. insinuatus	Barcelos (00°36′59.92″ S, 062°55′54.82″ W); Coari (04°10′50.95″ S, 063°09′30.77″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Manacapuru (03°23′46.71″ S, 060°37′56.84″ W), Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W), Santo Antônio do Içá (03°02′39.40″ S, 069°05′49.03″ W), Tabatinga (04°13′53.83″ S, 069°56′12.98″ W)	0004-1
	C. spurius	Coari (04°10′50.95″ S, 063°09′30.77″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W)	0005-2
	C. todatangae	Manacapuru (03°23′46.71″ S, 060°37′56.84″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W)	0005-1
	C. youngi	***	***
Haematomyidium/ paraensis	*C. neoparaensis*	Manaus (03°03′00.97″ S, 060°01′29.92″ W)	***
	C. paraensis	Barcelos (00°36′59.92″ S, 062°55′54.82″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), São Gabriel da Cachoeira (01°03′44.5″ S, 067°35′36.0″ W), Santa Isabel do Rio Negro (00°24′49.74″ S, 065°01′00.60″ W),Tabatinga (04°13′53.83″ S, 069°56′12.98″ W)	0001-13
	C. quasiparaensis	Coari (04°10′50.95″ S, 063°09′30.77″ W Manaus (03°00′32.04″ S, 059°56′49.84″ W), Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W) Tabatinga (04°13′53.83″ S, 069°56′12.98″ W)	0005-6
Hoffmania /guttatus	*C. batesi**	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-2
	C. bimaculatus	***	***
	C. brasilianum	***	***
	*C. brownei***	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-3
	C. coutinhoi	Manaus (03°03′00.97″ S, 060°01′29.92″ W), Parintins (02°38′15.99″ S, 056°43′46.29″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-13
	C. diabolicus	Coari (04°10′50.95″ S, 063°09′30.77″ W), Manacapuru (03°23′46.71″ S, 060°37′56.84″ W), Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), São Gabriel da Cachoeira (01°03′44.5″S 67°35′36.0″ W), Tabatinga (04°13′53.83″ S, 069°56′12.98″ W)	0001-14
	C. filariferus	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), Rio Preto da Eva (02°41′55.06″ S, 059°42′01.01″ W)	0001-15
	*C. flavivenulus**	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-4
	C. foxi	Barcelos (00°36′59.92″ S, 062°55′54.82″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), São Gabriel da Cachoeira (01°03′44.5″ S, 067°35′36.0″ W), Tabatinga (04°13′53.83″ S, 069°56′12.98″ W), Tefé (03°21′05″ S, 064°42′53″ W)	0001-16
	*C. franklini**	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-5
	C. fusipalpis	Barcelos (00°36′59.92″ S, 062°55′54.82″ W), Coari (04°10′50.95″ S, 063°09′30.77″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-17
	C. ignacioi	Manaus (03°03′00.97″ S, 060°01′29.92″ W), Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-18
	C. insignis	Barcelos (00°36′59.92″ S, 062°55′54.82″ W), Coari (02°13′14.38″ S, 063°49′40.72″ W), Manacapuru (03°23′46.71″ S, 060°37′56.84″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Santo Antônio do Içá (03°02′39.40″ S, 069°05′49.03″ W), Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), Tabatinga (04°13′53.83″ S, 069°56′12.98″ W), Tefé (03°21′05″ S, 064°42′53″ W)	0001-19
	C. lutzi	Manaus (03°00′32.04″ S, 059°56′49.84″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), Santo Antônio do Içá (03°02′39.40″ S, 069°05′49.03″ W)	0001-20
	C. ocumarensis	Benjamin Constant (04°24′51.48″ S, 069°39′33.05″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-21
	C. paraignacioi	Manaus (02°45′31.15″ S, 061°00′17.82″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), Santa Isabel do Rio Negro (00°24′49.74″ S, 065°01′00.60″ W), Tefé (03°21′05″ S, 064°42′53″ W)	0001-22
	*C. paramaruim**	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-7
	C. plaumanni	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-23

Continued

Table 1. *Continued.*

Subgenus/group	Species	Municipalities /Coordinates	Voucher number
	C. pseudodiabolicus	Barcelos (00°36′59.92″ S, 062°55′54.82″ W), Coari (02°13′14.38″ S, 063°49′40.72″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W), Novo Airão (02°42′43.17″ S, 060°56′48.13″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W), Santa Isabel do Rio Negro (00°24′49.74″ S, 065°01′00.60″ W), Tefé (03°21′05″ S, 064°42′53″ W)	0001-24
	C. ruizi	Manacapuru (03°23′46.71″ S, 060°37′56.84″ W)	***
	*C. tidwelli***	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-9
	C. travassosi	***	***
Hoffmania / hylas	*C. aitkeni*	Tefé (03°21′05″ S, 064°42′53″ W)	0002-2
	C. baniwa	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W)	0001-25
	C. heliconiae	Santa Isabel do Rio Negro (00°24′49.74″ S, 065°01′00.60″ W)	***
	C. hylas	Barcelos (00°36′59.92″ S, 062°55′54.82″ W), Coari (02°13′14.38″ S, 063°49′40.72″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Novo Airão (05°14′19.59″ S, 060°57′03.77″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W), Santa Isabel do Rio Negro (00°24′49.74″ S, 65°01′00.60″ W), Tefé (03°21′05″ S, 064°42′53″ W)	0001-26
	C. palpalis	***	***
	C. polypori	São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W)	***
	C. pseudoheliconiae	Tefé (03°21′05″ S, 064°42′53″ W)	***
	C. verecundus	Barcelos (00°36′59.92″ S, 062°55′54.82″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), Santa Isabel do Rio Negro (00°24′49.74″ S, 065°01′00.60″ W),Tefé (03°21′05″ S, 064°42′53″ W)	0001-27
Mataemyia	*C. aldomari**	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-1
	C. bricenoi	Coari (04°10′50.95″ S, 063°09′30.77″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-27
	C. discrepans	Manaus (03°03′00.97″ S, 060°01′29.92″ W)	***
	C. felippebauerae	Manaus (03°03′00.97″ S, 060°01′29.92″ W)	***
	C. wallacei	Benjamin Cosntant (04°24′51.48″ S, 069°39′33.05″ W), Coari (02°13′14.38″ S, 063°49′40.72″ W), São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W)	***
Oecacta	*C. alahialinus*	Manaus (03°03′00.97″ S, 060°01′29.92″ W)	***
Unplaced / *acotylus*	*C. acotylus*	Presidente Figueiredo (01°55′05.53″ S, 059°28′30.23″ W)	***
Unplaced / *carpenteri*	*C. belemensis*	Manaus (02°45′31.15″ S, 061°00′17.82″ W)	0002-1
	C. camposi	Barcelos (00°36′59.92″ S, 062°55′54.82″ W)	***
	C. carpenteri	Fonte Boa (02°48′01.79″ S, 066°18′47.08″ W), Manaus (03°03′00.97″ S, 060°01′29.92″ W)	***
Unplaced / *dasyophrus*	*C. dasyophrus*	Coari (04°10′50.95″ S, 063°09′30.77″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-28
Unplaced / *eublepharus*	*C. eublepharus*	Manaus (03°00′32.04″ S, 059°56′49.84″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-29
	C. propriipennis	Coari (04°10′50.95″ S, 063°09′30.77″ W), Manaus (03°03′00.97″ S, 060°01′29.92″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W) & São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W)	0001-30
	C. rangeli	Santa Isabel do Rio Negro (00°24′49.74″ S, 065°01′00.60″ W)	***
Unplaced / *fluvialis*	*C. fluvialis*	Manaus (03°03′00.97″ S, 060°01′29.92″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-31
	C. leopoldoi	Coari (04°10′50.95″ S, 063°09′30.77″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W),Tefé (03°21′05″ S, 064°42′53″ W)	0001-32
	C. tetrathyris	Coari (04°10′50.95″ S, 063°09′30.77″ W), Manaus (03°03′00.97″ S, 060°01′29.92″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-33
Unplaced / *leoni*	*C. benarrochi*	Manaus (03°03′00.97″ S, 060°01′29.92″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W)	0001-34
	C. fieldi	Manaus (03°03′00.97″ S, 060°01′29.92″ W)	***
	C. glabellus	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), Tefé (03°21′05″ S, 064°42′53″ W)	0001-35
	C. leoni	Manaus (03°03′00.97″ S, 060°01′29.92″ W)	***
Unplaced / *limai*	*C. antunesi*	***	***
	C. galindoi	Manacapuru (03°23′46.71″ S, 060°37′56.84″ W), Manaus (03°03′00.97″ S, 060°01′29.92″ W), São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W)	0004-2
	C. limai	Manaus (03°03′00.97″ S, 060°01′29.92″ W), Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W), São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W)	0001-36
	C. lopesi	Manacapuru (03°23′46.71″ S, 060°37′56.84″ W), Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W)	0004-3
	C. santanderi	São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W)	***
	C. vernoni	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0005-3
Unplaced / *pachymerus*	*C. caprilesi*	São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W)	***
	C. pachymerus	Manaus (03°03′00.97″ S, 060°01′29.92″ W), São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W)	***
Unplaced / *reticulatus*	*C. aureus*	Manaus (03°03′00.97″ S, 060°01′29.92″ W)	0005-4
	C. castelloni	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	CCER
	C. fittkaui	Coari (04°10′50.95″ S, 063°09′30.77″ W)	***

Continued

Table 1. *Continued.*

Subgenus/group	Species	Municipalities /Coordinates	Voucher number
	*C. guamai**	Presidente Figueiredo (31°48′01.66″ S, 060°18′59.82″ W)	0001-37
	C. hildebrandoi	Presidente Figueiredo (01°55′05.53″ S, 059°28′30.23″ W)	0003-1
	C. irregularis	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-38
	C. kuripako	São Gabriel da Cachoeira (01°03′44.5″ N, 067°35′36.0″ W)	***
	C. lanei	Manaus (03°03′00.97″ S, 060°01′29.92″ W)	***
	C. paucienfuscatus	Coari (04°10′50.95″ S, 063°09′30.77″ W), Manaus (03°00′32.04″ S, 059°56′49.84″ W), Novo Aripuanã (05°26′03.28″ S, 060°57′05.70″ W), Novo Airão (02°42′43.17″ S, 060°56′48.13″ W), Tefé (03°21′05″ S, 064°42′53″ W)	0005-5
	C. profundus	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-39
	C. pseudoreticulatus	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-40
	C. rhombus	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-41
Unplaced / *stigmalis*	*C. fluviatilis*	Presidente Figueiredo (01°48′01.66″ S, 060°18′59.82″ W)	0001-42
Unplaced / ungrouped	*C. wokei*	Manaus (03°03′00.97″ S, 060°01′29.92″ W)	***

* New records in Amazon State; ** new records in Brazil; ***Specific location & voucher number not found, occurrence done only to state.

paramaruim Wirth & Blanton, 1973; and *C. pusilloides* Wirth & Blanton, 1955.

Species composition

Subgenus *Anilomyia* Vargas, 1960

Anilomyia Vargas (1960): 37, as subgenus of *Culicoides*. Type species: *Culicoides covagarciai* Ortíz, by original designation.

Culicoides efferus Fox, 1952

(Figures 2, 10A)

Culicoides efferus Fox (1952): 365. Peru

Identification: Eyes contiguous, bare; third palpal segment long and slender with small sensorial pit; wing as figured, with very restricted dark spots, costa extending to 0.67 of wing length, macrotrichia very scanty on distal fourth of wing; halter whitish; spermathecae two, pyriform, subequal. Male with ninth sternum without posterior excavation; ninth tergum rounded caudad with only faint vestiges of apicolateral processes, deeply cleft mesad at apex with a pair of pointed; aedeagus narrow basally, anterior sclerotized membrane covering slightly more than distal half of basal arch, distal peg and apical spherical tip very slender; parameres fused more than halfway to apices, the free portions very slender, pointed, hairy, the common basal portion (Wirth and Blanton 1959).

Distribution: Bolivia, Brazil (Acre, Amazonas, and Pará); Guatemala to Peru.

Subgenus *Avaritia* Fox, 1955

Avaritia Fox (1955): 218, as subgenus of *Culicoides*. Type species: *Ceratopogon obsoletus* Meigen, by original designation.

Culicoides pusilloides Wirth & Blanton, 1955

(Figures 2, 10B)

Culicoides pusilloides Wirth and Blanton (1955): 104. Panama.

Identification: Medium-sized, dark brown; wing as figured; legs brown with pale bands; third segment palpus pit deep; spermathecae subspherical and very unequal. This species is differs from *C. pusillus,* from which it can be distinguished by second radial cell distinctly pale on the apical half, while in *C. pusillus* the second radial cell is pale only on extreme distal (Wirth and Blanton 1959).

Distribution: Belize to Panama, Brazil (Acre and Amazonas) and Guatemala

New records: Brazil, Amazonas State, Presidente Figueiredo, Rio Pardo (01°48′S, 060°19′ W), VII-2010, 0001-8 (1 female), CDC light trap, peridomicilies, F.A.C. Pessoa collector.

Culicoides pusillus Lutz, 1913

(Figures 2, 10C)

Culicoides pusillus Lutz (1913): 52. Rio de Janeiro, Brazil.

Identification: Small size, bare; wing as shown in figure, without marginal pale spots, the very short, entirely dark second radial cell, blackish mesonotum with two faint darker vittae and relatively pale. This species is an exception among the related species of the subgenus *Culicoides* (*Avaritia*) due to the apex of the very short second radial cell entirely dark or only very slightly encroached on by the poststigmatic pale spot (Wirth and Blanton 1959).

Distribution: Florida, USA to Central and South America to northeastern Argentina and Brazil (Acre, Amapá, Amazonas, Pará, Bahia, Minas Gerais, Rio de Janeiro, São Paulo, and Santa Catarina).

Subgenus *Diphaomyia* Vargas, 1960

Diphaomyia Vargas (1960): 40. Type species: *Culicoides baueri* Hoffman, by original designation.

Culicoides freitasi Wirth & Blanton, 1973

(Figures 2, 10D)

Culicoides freitasi Wirth and Blanton (1973): 434. –Pará, Brazil.

Identification: Eyes narrowly separated, bare; third palpal segment moderately swollen, with a round deep sensory pit; wing as figured and similar in pattern to *C. iriatei* Fox 1952, but differs due to two pale spots in the distal portion of the anal cell and only pale spot lyring adjacent to the proximal portion of vein M_1; halter pale; two spercathecae (Wirth and Blanton 1973).

Distribution: Brazil (Amazonas and Pará).

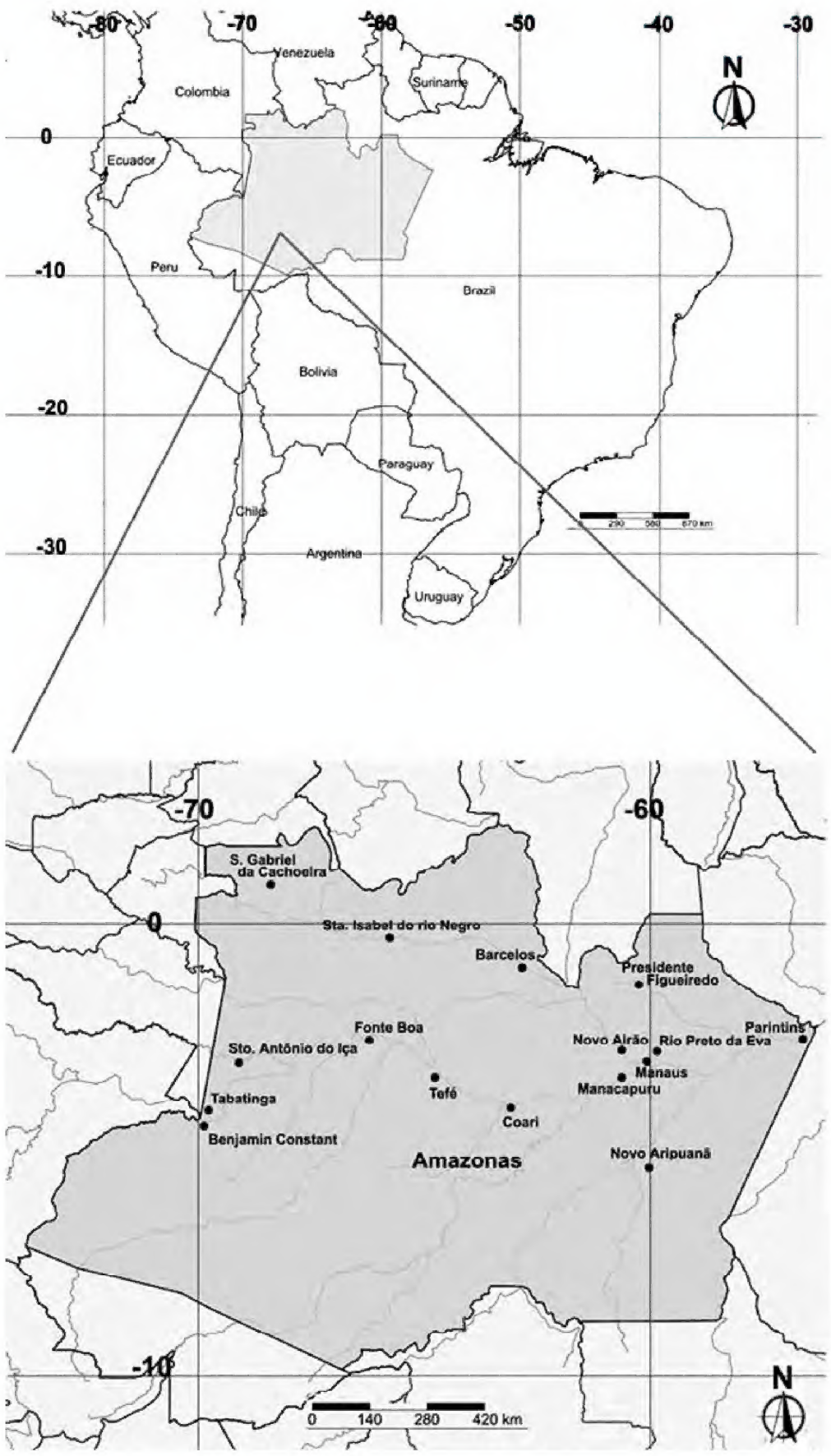

Figure 1. Maps showing the position of Amazonas state in Brazil and South America. Large image shows the municipalities where there were records of *Culicoides* (modified after SimpleMappr, http://www.simplemappr.net).

Subgenus *Haematomyidium* Goeldi, 1905

Haematomyidium Goeldi (1905): 137. Type species: *Haematomyidium paraensis* Goeldi, by original designation.

Culicoides crucifer Clastrier, 1968
(Figure 2)

Culicoides crucifer Clastrier (1968): 85. French Guiana.

Identification: A large species; third palpal segment slender with broad shallow pit; wing with distal pale spot in cell m_1 lying far from wing margin, no pale spot present in cell m_2 lying adjacent to midportion of mediocubital stem; aedeagus conspicuously cleft distad with two sharp laterally directed teeth on each side; parameres with simple twisted tips without fringing spines (Vitale et al. 1981).

Distribution: Brazil (Amazonas, Pará), French Guiana, Guyana, and Trinidad.

Culicoides debilipalpis Lutz, 1913
(Figures 2, 10E)

Culicoides debilipalpis Lutz (1913): 60. São Paulo, Brazil.
Culicoides khalafi Beck (1957): 104. Florida, USA.
Culicoides ichesi Ronderos and Spinelli (1995): 77. Argentina.

Identification: Third palpal segment stout, PR 2.00–2.60; flagellomere 8 longer than 9; wing as shown in figure, with distal pale spot in cell m_1 separated from wing margin by a distance aproximate to its length, macrotrichia distributed on distal two-thirds of wing, extending in at least two rows to base of cell m_2; halter brown (Spinelli et al. 2005).

Distribution: USA (Maryland, Kentucky, and Nebraska, south to Lousiana and Florida), Guatemala and Belize to Argentina and Brazil (Acre, Amapá, Amazonas, Ceará, Goiás, Espírito Santo, Mato Grosso do Sul, Pará, Pernambuco, São Paulo, Santa Catarina, and Roraima).

Culicoides denisae Clastrier, 1971
(Figure 2)

Culicoides denisae Clastrier (1971): 290. French Guiana.

Identification: Eyes narrowly separated; third palpal segment moderately swollen, PR 2.0; AR 0.9; wing with distal light spot transverse in r_3, r-m with light spot, presence of two bright spots in cell m_1, the second spot not touch the edge of the wing, without clear area on one-third of vein M_2, apices of veins M_1 and M_2 usually clear; light spot more or less confluent in anal cell. (Waller et al. 1990).

Distribution: Brazil (Amazonas, Pará) and French Guiana.

Culicoides glabrior Macfie, 1940
(Figures 2, 10F)

Culicoides debilipalpis var. *glabrior* Macfie (1940): 27. Guyana.
Culicoides grahambelli Forattini (1956a): 35. Panama.

Identification: Eyes bare, broadly contiguous; third segment broad, with a very broad, shallow sensory pit; fourth segment much broader than fifth; wing with transverse distal spot in cell r_3, only one distal spot in cell m_2, pale spots present behind medial fork and in front of mediocubital fork, a single transverse pale spot in apex of anal cell, extending nearly to wing margin; halter brown, the end of the knob slightly paler; spermathecae two, pyriform, subequal (Wirth and Blanton 1959).

Distribution: Brazil (Acre, Amazonas, Pará, and Roraima), Guyana, Honduras to Ecuador, Suriname, and Trinidad

Culicoides hoffmani Fox, 1946

Culicoides hoffmani Fox (1946): 251. Trinidad.

Identification: Eyes separated, the line of separation broad above but narrowed below, short interfacetal hairs; third segment very short and swollen, with a moderately large and deep sensory pit; distal pale spot in cell r_3 moderately large, rounded; two pale spots in cell m_1; one pale spot each in apices of cells m_2, CuA_1 and anal cell; a

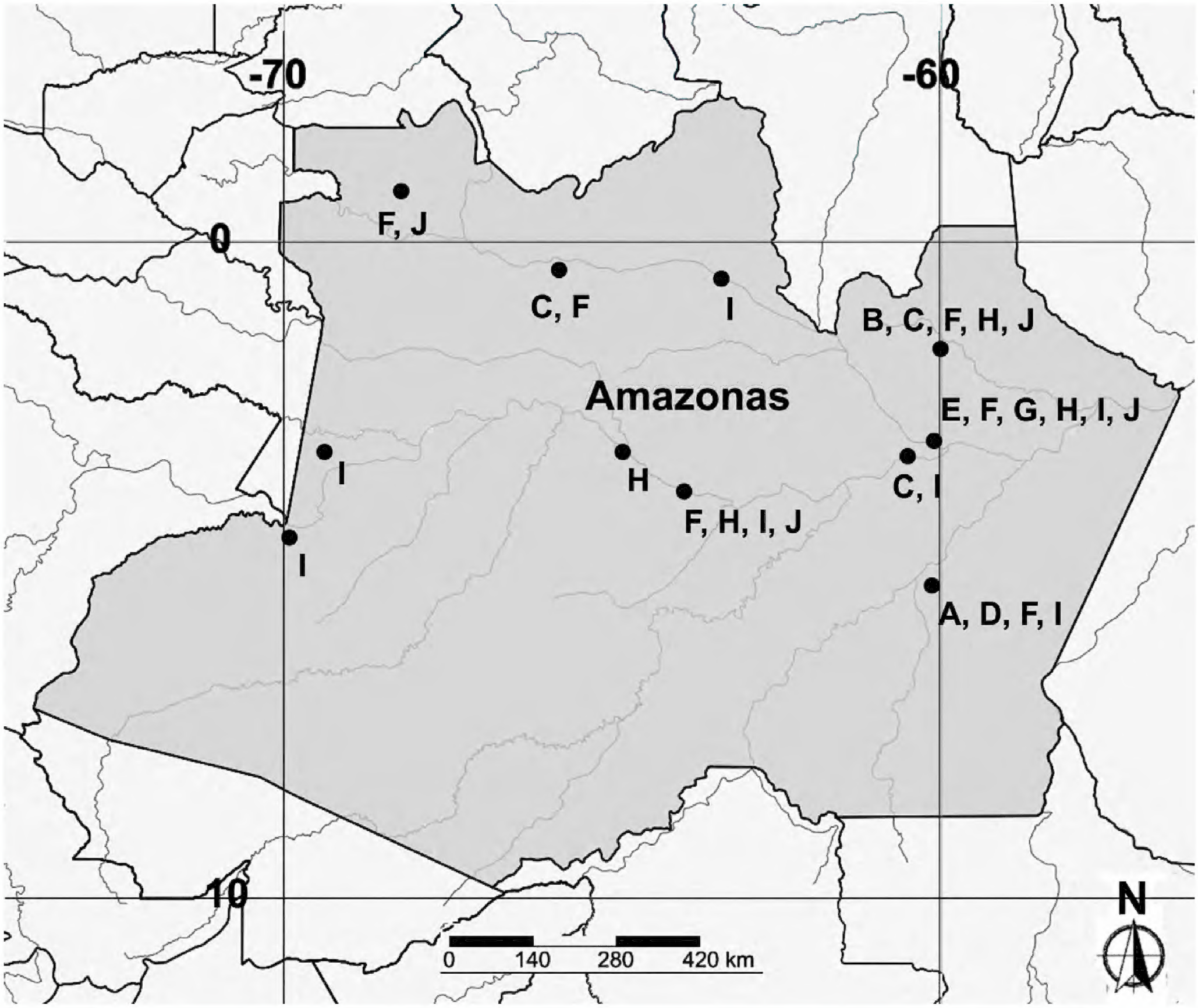

Figure 2. Map of the distribution of *Culicoides* species in Amazonas state, Brazil. **A.** *Culicoides efferus*. **B.** *C. pusilloides*. **C.** *C. pusillus*. **D.** *C. freitasi*. **E.** *C. crucifer*. **F.** *C. debilipalpis*. **G.** *C. denisae*. **H.** *C. glabrior*. **I.** *C. insinuatus*. **J.** *C. spurius* (modified after SimpleMappr, http://www.simplemappr.net).

pale spot lying ahead of mediocubital fork and another pale spot lying behind medial fork; halter brown, the flat end of the knob whitish; spermathecae two, pyriform, slightly unequal (Wirth and Blanton 1959).

Distribution: Brazil (Amazonas), Belize, Costa Rica, Cayman Islands, and Jamaica to Trinidad.

Culicoides insinuatus Ortíz & León, 1955
(Figures 2, 10G)

Culicoides insinuatus Ortíz and León (1955): 577. Ecuador.

Identification: Eyes broadly separated; third palpal segment broader with shallow sensory pit; wing as figured, much shorter and broader with the pale spot grayish rather than whitish, the halter dark brownish, a distinct pale spot present in front of mediocubital fork; distinct ventral lobe present on the male parameres (Wirth and Blanton 1973, in *C. todatangae*).

Distribution: Brazil (Acre, Amapá, Amazonas, Pará, Roraima and São Paulo), Colombia, Ecuador, Guyana, Peru, and Trinidad.

Culicoides spurius Wirth & Blanton, 1959
(Figures 2, 10H)

Culicoides spurius Wirth and Blanton (1959): 433. Panama.

Identification: Eyes broadly separated, third segment very short and swollen, with a large, deep sensory pit; wing with pale spot over r-m crossvein about as broad as long, poststigmatic pale spots in cell r_3 small and rounded, well separated, the posterior one slightly larger and located slightly proximad of the anterior one; distal pale spot in cell r_3 moderately large, rounded; two pale spots in cell m_1, CuA_1 and anal cell; definite pale spots present behind medial fork and in front of mediocubital fork (Wirth and Blanton 1959).

Distribution: Brazil (Acre, Amazonas and Roraima), Costa Rica, and Panama.

Culicoides todatangae Wirth & Blanton, 1973
(Figures 3, 10I)
Culicoides todatangae Wirth and Blanton (1973): 447. Pará, Brazil.

Identification: Eyes narrowly separated, with long interfacetal hairs; third palpal segment long and slender, with a small sensory pit deeper than diameter of pore opening; wing as shown in figure; halter slightly infuscated; spermathecae two, oval with long slender necks, slightly unequal; halter slightly infuscated. This species resembles *C. insinuatus* both species having the pale sport in cell m_2 in front of mid-portion of the mediocubital stem (Wirth and Blanton 1973).

Distribution: Brazil (Acre, Amapá, Amazonas, Pará, and Santa Catarina) and Trinidad.

Culicoides youngi Wirth & Barreto, 1978
Culicoides youngi Wirth and Barreto (1978): 562. Colombia.

Identification: Eyes nearly contiguous; third segment short and swollen to tip, with broad, round, shallow, sensory pit opening by a slightly smaller pore; second radial cell dark to tip with moderately broad lumen, slightly tapering distally, pale spot over r-m crossvein transverse, poststigmatic pale spot in cell r_3 not divided, continued and expanded around posterior margin of second radial cell; distal pale spot presente in cell r_3, cell m_1 with two pale spots, cell m_2 with distinct pale spot lying behind medial fork and indistinct spot in front of mediocubital fork and a pale spot at apex of cell near wing margin, cell CuA_1 with large rounded pale spot in distal portion, anal cell with pale spot in distal portion, dark at base; vein M_1 with distinct pale spot at wing margin (Wirth and Barreto 1978).

Distribution: Brazil (Amazonas) and Colombia.

Culicoides neoparaensis Tavares & Souza, 1978
(Figure 3)
Culicoides neoparaensis Tavares and Souza (1978): 621. Rio de Janeiro, Brazil.

Identification: Wing with three pale spots in cell m_1, distal pale spot distinctly separated from the subapical pale spot; third segment palpus short and stout (PR 1.7); sclerotized ring short; third rudimentary spermatheca greatly elongate. Male: paramere with definite broad ventral swelling, without elongate lobe (Felippe-Bauer et al. 2003).

Distribution: Brazil (Amazonas, Rio de Janeiro, and Santa Catarina).

Culicoides paraensis (Goeldi, 1905)
(Figures 3, 10J)
Haematomyidium paraensis Goeldi (1905): 137. Pará, Brazil.
Culicoides undecimpunctatus Kieffer (1917): 307. Argentina.

Identification: Third segment palpus longer and more slender (PR 2.1–2.8); wing with three pale spots in cell m_1, distal pale spot distinctly separated from the subapical pale spot; third rudimentary spermatheca shorter; sclerotized ring long and curved; male with paramere uniformly slender in midportion, with elongate lobe (Felippe-Bauer et al. 2003).

Distribution: USA to Argentina and Brazil (Acre, Amazonas, Pará, Roraima, Bahia, Ceará, Maranhão, Pernambuco, Mato Grosso do Sul, Epírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, and Santa Catarina).

Culicoides quasiparaensis Clastrier, 1971
(Figures 3, 10K)
Culicoides quasiparaensis Clastrier (1971): 286. French Guiana.

Identification: Eyes narrowly separated above, contiguous below, the interocular space wedge-shaped; third palpal segment broad (PR 1.7) with pit broad and shallow, rarely deep and opening by a smaller pore; wing as shown in figure with three pale spots in cell m_1; distal pale spot distinctly separated from the subapical pale spot; spermathecae very unequal sized (Felippe-Bauer et al. 2003).

Distribution: Honduras, and El Salvador, south to Colombia, Peru, French Guiana, and Brazil (Acre, Amazonas, Pará, Rondônia, Roraima, and Maranhão).

Subgenus *Hoffmania* Fox, 1948
Hoffmania Fox 1948: 21 (as subgenus of *Culicoides*). Type species: *Culicoides inamollae* Fox & Hoffman, 1944 (= *Culicoides insignis* Lutz, 1913, by original designation.

Culicoides aitkeni Wirth & Blanton, 1968
(Figures 5)
Culicoides aitkeni Wirth and Blanton (1968): 214. Trinidad and Tobago.

Identification: Third palpal segment with scattered sensilla; wing length 1.50 mm; r_3 with pale spot present anterior to base of M_1 and in apices of CuA_1 and CuA_2, a single pale spot crossing second radial cell; mid and hind femur with subapical pale band; spermathecae with short, slender necks. (Felippe-Bauer et al. 2009).

Distribution: Brazil (Amazonas, Pará); Trinidad and Tobago.

Culicoides baniwa Felippe-Bauer, 2009
(Figure 5, 10L)
Culicoides baniwa Felippe-Bauer *in* Felippe-Bauer et al. (2009): 852. Amazonas, Brazil.

Identification: This species is easily distinguished from the other species of the *hylas* group by the presence of double pale spots in r_3, one crossing second radial cell and the other in distal portion of r_3, by the absence of pale spot in front of base of M_1 and by the mid femur dark to tip (Felippe-Bauer et al. 2009).

Distribution: Brazil (Amazonas) and Peru.

****Culicoides batesi*** Wirth & Blanton, 1973
(Figures 3, 10M)
Culicoides batesi Wirth and Blanton (1973): 426. Brazil -– Pará, Brazil.
Culicoides sanmartini Wirth and Barreto (1978): 553. Colombia.

Identification: This species is small to medium-sized,

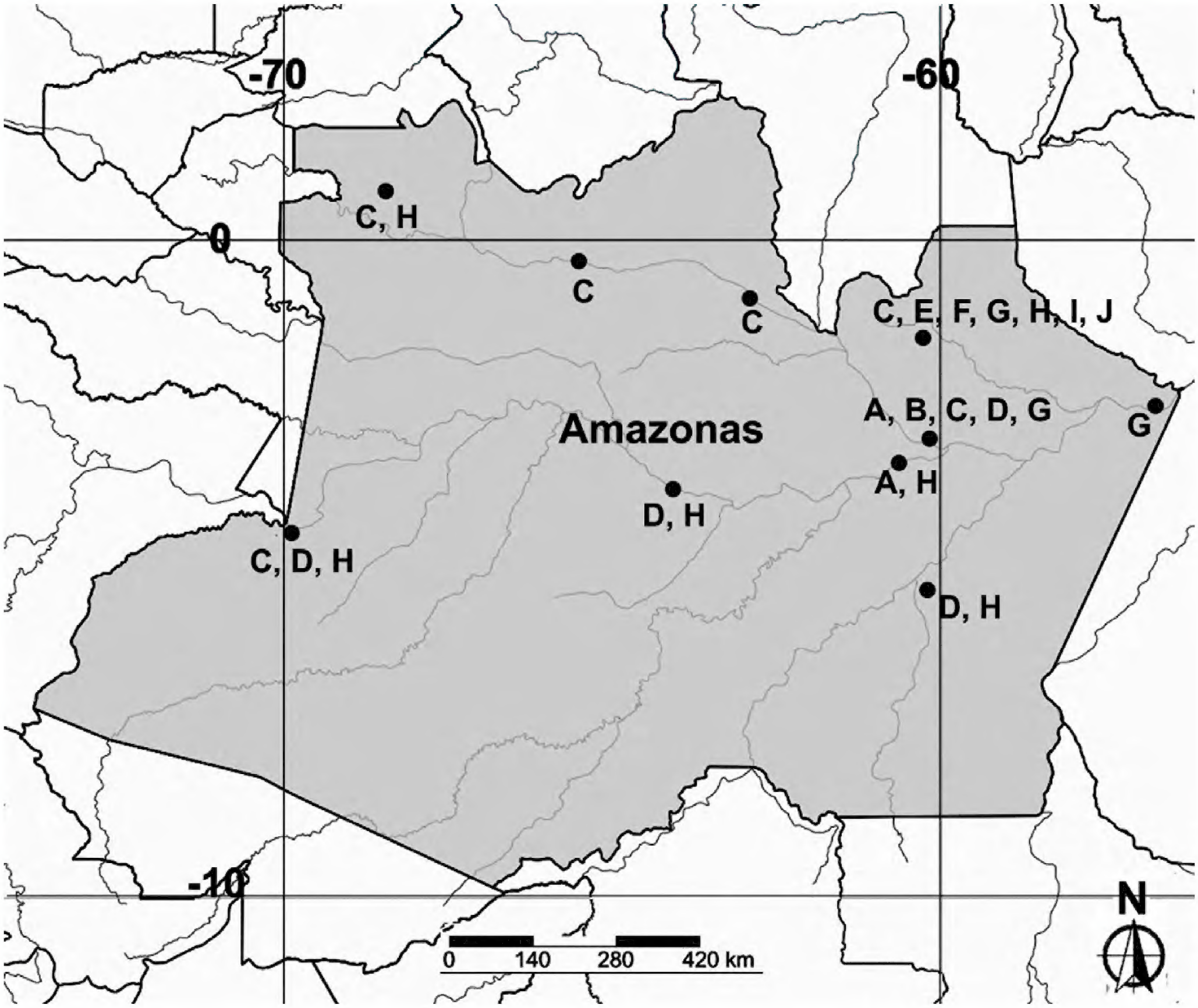

Figure 3. Map of *Culicoides* species distribution in Amazonas State, Brazil. **A.** *C. todatangae*. **B.** *C. neoparaensis*. **C.** *C. paraensis*. **D.** *C. quasiparaensis*. **E.** *C. batesi*. **F.** *C. brownei*. **G.** *C. coutinhoi*. **H.** *C. diabolicus*. **I.** *C. filariferus*. **J.** *C. flavivenulus* (modified after SimpleMappr, http://www.simplemappr.net).

dark brown; eyes contiguous by a distance equal to diameter of 2–3.5 ommatidial facets; third segment palpus moderately stout, sensory pit irregular. *Culicoides batesi* is very similar to *C. lutzi,* from which it can be distinguished by the faintly darkened r-m crossvein, dark apex of vein CuA_1 (Broadly pale em *C. lutzi*); macrotrichia present on distal one-third of wing, and dark halter (Spinelli et al. 1993).

Distribution: Bolivia, Colombia, Ecuador, Brazil (Amazonas, Pará, and Rondônia), and Guatemala

New records: Brazil, Amazonas state, Presidente Figueiredo, Rio Pardo (01°48′ S, 060°19′ W), VI-2010, VII-2010, VIII-2010, 0001-2 (4 females), CDC light traps, forest fragments and peridomicilies, F.A.C. Pessoa collector.

Culicoides bimaculatus Floch & Abonnenc, 1942

Culicoides bimaculatus Floch and Abonnenc (1942a): 3. French Guiana.

Identification: Eyes contiguous by a distance equal to the diameter of 2 ommatidial facets; wing with r-m crossvein pale, one transverse distal pale spot in cell r_3 broadly reaching wing margin, two distal pale spots in cell m_1 (the second one very faint in two of the available specimens), apices of veins M_1, M_2, CuA_1 pale, apex of vein CuA_2 dark; spermathecae small, spherical, subequal with short necks. This species resembles *C. foxi* by virtue of the presence of a small blackish spot behind the apex of the second radial cell, and by the dark brown halter. Also, it can be distinguished from *C. foxi* by the stouter third palpal segment with irregular sensory pit, and by the pale r-m crossvein (Spinelli et al. 1993).

Distribution: Brazil (Amazonas, Pará) and French Guiana.

Culicoides brasilianum Forattini, 1956

Culicoides brasilianum Forattini (1956b): 81. São Paulo, Brazil.

Identification: Eyes contiguous by a distance equal to the diameter of 1 ommatidial facet; third palpal

segment slightly broader just beyond middle, pit irregular; r-m crossvein pale, one transverse distal pale spot in cell r_3 broadly meeting wing margin, two distal pale spots in cell m_1, apices of veins M_1, M_2 and CuA_1 pale, apex of vein CuA_2 dark; halter knob dark, pedicel pale; spermathecae pyriform, unequal. Male genitalia with apicolateral processes of ninth tergum small and close together; aedeagus with terminal papilla; parameres connected at bases by a short loop, main bodies stout, apex with minute fringing hairs. This species distinguished from the related species by the wing pattern with extensive pale areas; from *C. guttatus* it also differs in the pale r-m crossvein and dark halter, and from *C. ignacioi* by the pale r-m crossvein (Spinelli et al. 1993).

Distribution: Northeastern Argentina and Brazil (Amazonas, Pará, Pernambuco, Rio de Janeiro, São Paulo, and Santa Catarina).

***Culicoides brownei** Spinelli, 1993
(Figures 3, 10N)
Culicoides brownie Spinelli et al. (1993): 24. Colombia.

Identification: Wing with second distal pale spot in cell m_1 sometimes faint or ausent. This species is very similar to *C. franklini*, from which it can be distinguished by the stouter third palpal segment with irregular pit, eyes contiguous for 2.5–3.0 ommatidial facets (by 4 or 5 facets in *C. franklini*), and by its dark halter (Spinelli et al. 1993).

Distribution: Colombia and Brazil (Amazonas).

New records: Brazil, Amazonas state, Presidente Figueiredo, Rio Pardo (01°48′ S, 060°19′ W), VIII-2010, 0001-3 (1 female), CDC light trap, peridomicily, F.A.C. Pessoa collector.

Culicoides coutinhoi Barretto, 1944
(Figures 3, 10O)
Culicoides coutinhoi Barretto (1944): 96. São Paulo, Brazil.

Identification: Eyes contiguous by a distance equal to the diameter of 3 ommatidial facets; third palpal segment stout, with irregular sensory pit; wing as in figure. This species is similar to *C. pseudodiabolicus*, from which it can be distinguished by the stout palpus with irregular pit (subdivided in *C. pseudodiabolicus*), by the small apicolateral processes closer together, and by the terminal papilla of the aedeagus (Spinelli et al. 1993).

Distribution: Brazil (Amazonas, Pará, and São Paulo) and French Guiana

Culicoides diabolicus Hoffman, 1925
(Figures 3, 10P)
Culicoides diabolicus Hoffman (1925): 294. Panama.

Identification: Eyes contiguous by a distance equal to diameter of 1.5–2.5 ommatidial facets; antenna brown, bases of flagellar segments 3–10 pale; third palpal segment slender, slightly broad in middle, pit irregular; wing as shown in figure, with r-m crossvein pale (faintly darkened in some topotypic specimens), one large, transverse, distal pale spot in cell r_3 broadly meeting wing margin, two distal pale spot in cell m_1, the distal one smaller, apices of veins M_1 and M_2 pale, apices of veins CuA_1 and CuA_2 dark; halter pale; spermathecae subspherical to ovoid, unequal (Spinelli et al. 1993).

Distribution: Mexico to Ecuador and Brazil (Amazonas, Roraima, Maranhão).

Culicoides filariferus Hoffman, 1939
(Figures 3, 10Q)
Culicoides filariferus Hoffman (1939): 172. Mexico.

Identification: Eyes contiguous by a distance equal to the diameter of 1.5–2.0 ommatidial facets; third palpal segment slightly broader in middle, with a conspicuous distal extension, pit irregular; wing as shown in figure, r-m crossvein pale (a faint darkish line, but not a definite dark spot, sometimes present on anterior half); one distal transverse pale spot in cell r_3 broadly meeting wing margin, two distal pale spot in cell m_1 (the second one faint or absent in some specimens); apices of veins M_1 and M_2 pale, apices of veins CuA_1 and CuA_2 dark (a few specimens with a faint pale area at apex of vein CuA_2); halter dark brown (Spinelli et al. 1993).

Distribution: Mexico (Veracruz and Chiapas) to northern Brazil (Amazonas and Pará).

***Culicoides flavivenulus** Costa Lima, 1937
(Figures 3, 10R)
Culicoides flavivenula [*sic*] Costa Lima (1937): 418. Brazil.

Identification: Eyes contiguous by a distance equal to the diameter of 1–2 ommatidial facets; wing as shown in figure, r-m crossvein pale, one transverse distal pale spot in cell r_3 reaching wing margin, only one distal pale spot in cell m_1, vein M_1 slightlly pale at apex; halter pale; spermathecae subspherical to pyriform, subequal. This species is similar to *C. lutzi,* from which it can be distinguished by the third palpal segment with a well-defined, round pit (irregular in *C. lutzi*); apices of veins M_2 and CuA_1 dark, broadly pale in *C. lutzi* (Spinelli et al. 1993).

Distribution: Panama, French Guiana, Trinidad, and Brazil (Amazonas, Pará, Bahia, Pernambuco, Mato Grosso do Sul, Espírito Santo, Rio de Janeiro, São Paulo, and Santa Catarina).

New records: Brazil, Amazonas state, Presidente Figueiredo, Rio Pardo (01°48′ S, 060°19′ W), VI-2010, VIII-2010, 0001-4 (3 females), CDC light traps, forest fragments and peridomicilies, F.A.C. Pessoa collector.

Culicoides foxi Ortíz, 1950 (Figures 4, 10S)
Culicoides foxi Ortíz (1950a): 461. Puerto Rico.

Identification: Eyes contiguous for a distance equal to the diameter of 1 ommatidial facet; third palpal segment elongated, pit rounded and shallow, the extension beyond the pit slender; wing as shown in figure, r-m crossvein entirely an deeply infuscated, one large, transverse, distal pale spot in cell r_3 broadly meeting wing

margin, two distal pale spots in cell m_1, apices of veins M_1, M_2 and CuA_1 broadly pale, apex of vein CuA_2 dark; halter knob deeply infuscated, pedicel pale; spermathecae subspherical to ovoid, unequal (Spinelli et al. 1993).

Distribution: Mexico to northeastern Argentina; Brazil (Amazonas, Pará, Roraima, Bahia, Maranhão, Pernambuco, Piauí, Goiás, Mato Grosso do Sul, Minas Gerais, Rio de Janeiro, São Paulo, and Paraná).

****Culicoides franklini*** Spinelli, Greiner & Wirth, 1993
(Figures 4, 10T)

Culicoides franklini Spinelli et al. (1993): 45. Panama.

Identification: Eyes contiguous for a distance equal to the diameter of 2–2.5 ommatidial facet; third palpal segment stout, with shallow, irregular pit; wing as shown in figure. This species is easily distinguished from *C. pseudodiabolicus, C. coutinhoi,* and *C. brownei* by the broadly contiguous eyes, very short proboscis, and third palpal segment shorter than combined lengths of segments 4 and 5 (Spinelli et al. 1993).

Distribution: Mexico (Guerrero) to Bolivia and Brazil (Amazonas and Pará).

New records: Brazil, Amazonas state, Presidente Figueiredo, Rio Pardo (01°48′ S, 060°19′ W), VI-2010, VIII-2010, 0001-5 (5 females), CDC light traps, forest fragments and peridomicilies, F.A.C. Pessoa collector.

Culicoides fusipalpis Wirth & Blanton, 1973
(Figures 4, 10U)

Culicoides fusipalpis Wirth and Blanton (1973): 435. Pará, Brazil

Identification: Eyes contiguous by a distance equal to the diameter of 2–2.5 ommatidial facets; third palpus segment fusiform, slightly swollen in midportion only, with scattered surface sensilla; wing as figured, r-m crossvein in a large pale spot, but vein slightly darkened, one large transverse distal pale spot in cell r_3, broadly meeting wing margin, one distal pale spot in cell m_1, apices of veins M_1 and M_2 narrowly pale, apices of veins CuA_1 and CuA_2 dark; halter pale; spermathecae subequal, subspherical with short sclerotized necks (Spinelli et al. 1993).

Distribution: El Salvador to Bolivia, Ecuador, French Guyana, Guyana, and Brazil (Acre, Amapá, Amazonas, Pará, Rondônia, Roraima, Bahia, Maranhão, and Rio de Janeiro).

Culicoides heliconiae Fox & Hoffman, 1944
(Figure 5)

Culicoides heliconiae Fox and Hoffman (1944): 108. Venezuela.

Identification: Third palpal segment with scattered sensilla; apical pale band on mid femur, hind femur dark to tip; wing with distal pale spot in r_3 narrow and transverse, r_3 with pale spot present anterior to base of M_1, a single pale spot crosses the second radial cell, apices of CuA_1 and CuA_2 pale; spermathecae with short, slender necks (Felippe-Bauer et al. 2009).

Distribution: Belize to Venezuela, Ecuador, and Brazil (Acre, Amazonas, and Pará); Grenada, and Trinidad and Tobago.

Culicoides hylas Macfie, 1940
(Figures 5, 11A)

Culicoides hylas Macfie (1940): 26. Guyana.

Identification: Irregular sensory pit in the third palpal segment; wing as shown, r_3 with pale spot present anterior to base of vein M_1, a single pale spot crossing the second radial cell, apices of CuA_1 and CuA_2 pale; mid femur with subapical pale band, hind femur dark to tip; spermathecae with short, slender necks (Felippe-Bauer et al. 2009).

Distribution: Mexico to Peru and Brazil (Amapá, Amazonas, Pará, Roraima, and Maranhão).

Culicoides ignacioi Forattini, 1957
(Figures 4, 11B)

Culicoides ignacioi Forattini (1957): 215. São Paulo, Brazil.
Culicoides saintjusti Tavares and Ruiz (1980): 27. Rio de Janeiro, Brazil.

Identification: Eyes contiguous by a distance equal to the diameter of 1.5 ommatidial facets; third palpus segment broad in middle, with conspicuous irregular pit; wing as shown in figure; halter knob bark brown, pedicel pale. This species is similar to *C. fernandoi*, from which it can be distinguished by the mandible with 20–22 teeth (14–15 in *C. fernandoi*), vein R_3 pale (infuscated on lower portion with a very small dark spot behind apex in *C. fernandoi*), distal pale spot in cell r_3 large, transverse (crescent-shaped or subdivided in *C. fernandoi*) (Spinelli et al. 1993).

Distribution: Brazil (Acre, Amazonas, Pará, Roraima, Maranhão, Minas Gerais, Rio de Janeiro, and São Paulo) and Paraguay.

Culicoides insignis Lutz, 1913
(Figures 4, 11C)

Culicoides insignis Lutz (1913): 51. Bahia and Rio de Janeiro, Brazil.
Culicoides inamollae Fox and Hoffman (1944): 110. Puerto Rico.
Culicoides painteri Fox (1946): 257. Puerto Rico.

Identification: Eyes contiguous by a distance equal to the diameter of 1.5 ommatidial facets; third palpal segment with definite, irregular pit; wing as shown in figure, r-m crossvein dark on anterior half; vein CuA_2 dark up to the point where it turns abruptly forward to meet the costa; only one distal pale spot in cell m_1; halter dark (Spinelli et al. 1993).

Distribution: USA, Mexico, Central America, and the Caribbean; Brazil (Amazonas, Pará, Bahia, Ceará, Paraíba, Pernambuco, Maranhão, Goiás, Mato Grosso, Mato Grosso do Sul, Espírito Santo, Minas Gerais, São Paulo, Rio de Janeiro, Rio Grande do Sul, and Santa Catarina).

Culicoides lutzi Costa Lima, 1937
(Figures 4, 11D)

Culicoides lutzi Costa Lima (1937): 419. Pará, Brazil.

Identification: Brown species; eyes contiguous by a

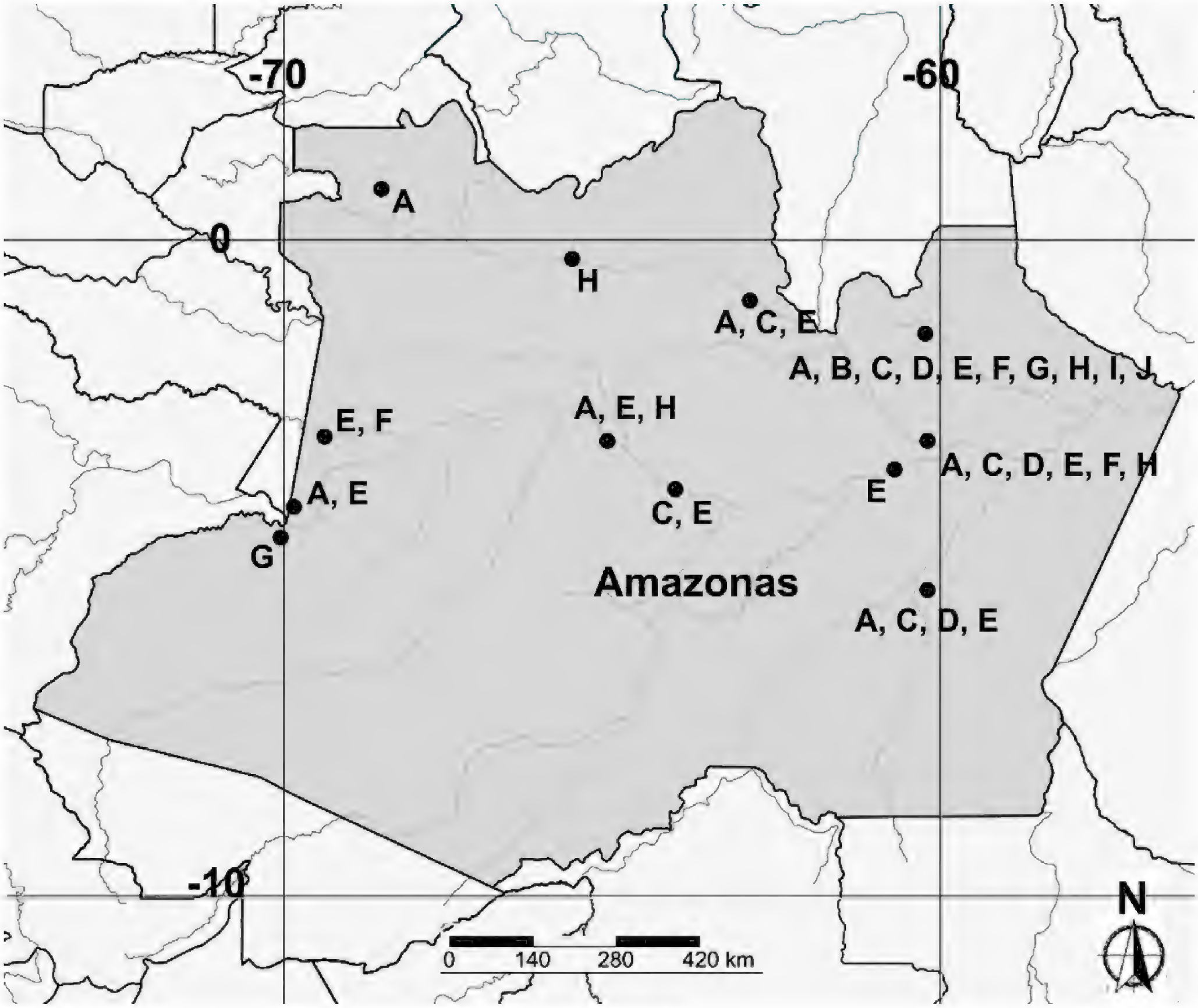

Figure 4. Map of *Culicoides* species distribution in Amazonas State, Brazil. **A.** *C. foxi*. **B.** *C. franklini*. **C.** *C. fusipalpis*. **D.** *C. ignacioi*. **E.** *C. insignis*. **F.** *C. lutzi*. **G.** *C. ocumarensis*. **H.** *C. paraignacioi*. **I.** *C. paramaruim*. **J.** *C. plaumanni* (modified after SimpleMappr, http://www.simplemappr.net).

distance equal to the diameter of 2–3 ommatidial facets; third palpal segment stout, with irregular pit; wing as shown in figure, crossvein r-m pale, one transverse distal pale spot in cell r_3 reaching wing margin, only one distal pale spot in cell m_1, apices of veins M_1, M_2 and CuA_1 broadly pale, apex of vein CuA_2 dark; halter knob pale (Spinelli et al. 1993).

Distribution: Colombia and French Guiana; Brazil (Acre, Amazonas, Pará, Rondônia, Roraima, Maranhão, Goiás, Mato Grosso, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, and Santa Catarina) and northeastern Argentina.

Culicoides ocumarensis Ortíz, 1950
(Figures 4, 11E)
Culicoides ocumarensis Ortíz (1950b): 455. Venezuela.

Identification: Eyes contiguous by a distance equal to the diameter of 1.5–2.0 ommatidial facets; third palpal segment slightly broader in middle, pit irregular; wing as shown in figure, *r*-m crossvein pale, one transverse distal pale spot in cell r_3 broadly meeting wing margin, two distal pale spot in cell m_1, apices of veins M_1 and M_2 pale, apices of veins CuA_1 and CuA_2 dark; halter dark brown (Spinelli et al. 1993).

Distribution: Mexico to northern Brazil (Amazonas, Pará, and Rondônia).

Culicoides palpalis Macfie, 1948
Culicoides palpalis Macfie (1948): 78. Mexico.

Identification: Third palpal segment with scattered sensilla; mid femur with apical pale band, hind femur dark to tip; wing with r_3 shows a pale spot present anterior to base of M_1, a single pale spot crosses the second radial cell, apices of CuA_1 and CuA_2 dark; spermathecae with short, slender necks; male tergite 9 with very small papilliform process on posterior margin; fused portion of the parameres shows a width to length ratio of 1.75 (Felippe-Bauer et al. 2009).

Distribution: Mexico to Peru and Brazil (Amazonas).

Culicoides paraignacioi Spinelli, 1993
(Figures 4, 11F)
Culicoides paraignacioi Spinelli *in* Spinelli et al. (1993): 66. Colombia.

Identification: Small wing length 1.14 mm, third palpal segment slender, with a rounded, small, shallow pit; wing as figured. This species is similar to *C. ignacioi,* which differs from the females of *C. paraignacioi* by being significantly larger (wing lenth 1.53 mm), and by having the third palpal segment stouter, with a conspicuous irregular sensory pit. The male genitalia of both species are also very similar, with apicolateral processes widely separated, apex of aedeagus truncated, and parameres broadly fused at base, but they differ in the shape of the ninth tergum, which is rounded distally in *C. ignacioi* and subquadrangular in *C. paraignacioi* (Spinelli et al. 1993).

Distribution: Belize, Costa Rica, Colombia, Guiana, and Brazil (Amazonas and Pará).

****Culicoides paramaruim*** Wirth & Blanton, 1973
(Figures 4, 11G)
Culicoides paramaruim Wirth and Blanton (1973): 443. –Pará, Brazil.

Identification: Medium-sized dark brown; wing as figured, r-m crossvein darkened, especially so on anterior half, vein CuA_1 infuscated, one transverse distal pale sport in cell r_3 not reaching wing margin; only one distal pale spot in cell m_1; apices of veins M_1, M_2, CuA_1 and CuA_2 dark. This species is differs from *C. maruim,* from which it can be distinguished by the third palpal segment stouter, while in *C. maruim* is long and slender (Spinelli et al. 1993).

Distribution: Brazil (Amazonas, Pará, and Maranhão).

New record — Brazil, Amazonas state, Presidente Figueiredo, Rio Pardo (01°48′ S, 060°19′ W), VII-2010, 0001-7 (1 female), CDC light trap, peridomicily, F.A.C. Pessoa collector.

Culicoides plaumanni Spinelli, 1993
(Figures 4, 11H)
Culicoides plaumanni Spinelli *in* Spinelli et al. (1993): 69. Argentina.

Identification: Medium-sized, eyes contiguous by a distance equal to the diameter of 1.5–2.5 ommatidial facets; third palpal segment with irregular pit; wing as shown in figure, r-m crossvein dark on anterior half, one distal, somewhat crescent-shaped pale sport in cell r_3 narrowly meeting wing margin, two distal pale spot in cell m_1, apices of veins M_1, M_2 and CuA_1 pale, apex of vein CuA_2 dark; halter dark brown (Spinelli et al. 1993).

Distribution: Bolivia, Peru, Brazil (Amazonas, Pará, and Minas Gerais) and northeastern Argentina.

Culicoides polypori Wirth & Blanton, 1968
Culicoides polypori Wirth and Blanton (1968): 212. Panama.

Identification: Third palpal segment with scattered sensilla; wing with r_3 with pale spot present anterior to base of M_1, a single pale spot crosses the second radial cell, apices of CuA_1 and CuA_2 dark; mid and hind femur with subapical pale band; spermathecae with short, slender necks; male tergite 9 with a bilobed process on posterior margin; fused portion of the parameres slightly longer than basal width (Felippe-Bauer et al. 2009).

Distribution: Honduras to Colombia and Brazil (Amazonas).

Culicoides pseudodiabolicus Fox, 1946
(Figures 5, 11I)
Culicoides pseudodiabolicus Fox (1946): 256. Trinidad.

Identification: Wing with contrasting pattern, r-m crossvein dark on anterior half, vein R_3 pale, one large transverse distal pale spot in cell r_3 broadly meeting wing margin, cell m_1 with two distal pale spots, apices of veins M_1, M_2 and CuA_1 pale, apex of vein CuA_2 dark, scattered macrotrichia present at apices of cells r_3, m_1, and m_2. Several species in the *guttatus* group are very similar to *C. pseudodiabolicus*, especially in wing; characteristic subdivided pit, pale halter, distinctly unequal spermathecae, and male aedeagus without terminal papilla (Spinelli et al. 1993).

Distribution: Mexico to Peru and Brazil (Acre, Amapá, Amazonas, Pará, Rondônia, Roraima, and Maranhão).

Culicoides pseudoheliconiae Felippe-Bauer, 2008
(Figure 5)
Culicoides pseudoheliconiae Felippe-Bauer *in* Felippe-Bauer et al. (2008): 260. Peru.

Identification: Pale diffuse wing markings, rather than brightly contrasting; r_3 with pale spot present anterior to base of M_1, pale spot that crosses the second radial cell subdivided in two separate spots, apices of CuA_1 and CuA_2 dark; third palpal segment with scattered sensilla; mid femur with apical pale band, hind femur dark to tip; spermathecae with short, slender necks (Felippe-Bauer et al. 2009).

Distribution: Peru (Madre de Dios and San Martin), Brazil (Amazonas), and Argentina (Misiones).

Culicoides ruizi Forattini, 1954
(Figure 5)
Culicoides ruizi Forattini (1954a): 189. Goiás, Brazil

Identification: This species is very similar to *C. travassosi*, from which it can be distinguished by the stouter palpus, pale r-m crossvein, and vein CuA_2 without a small blackish spot just beyond apex (Spinelli et al. 1993).

Distribution: Colombia and Brazil (Amazonas, Pará, Maranhão, and Goiás).

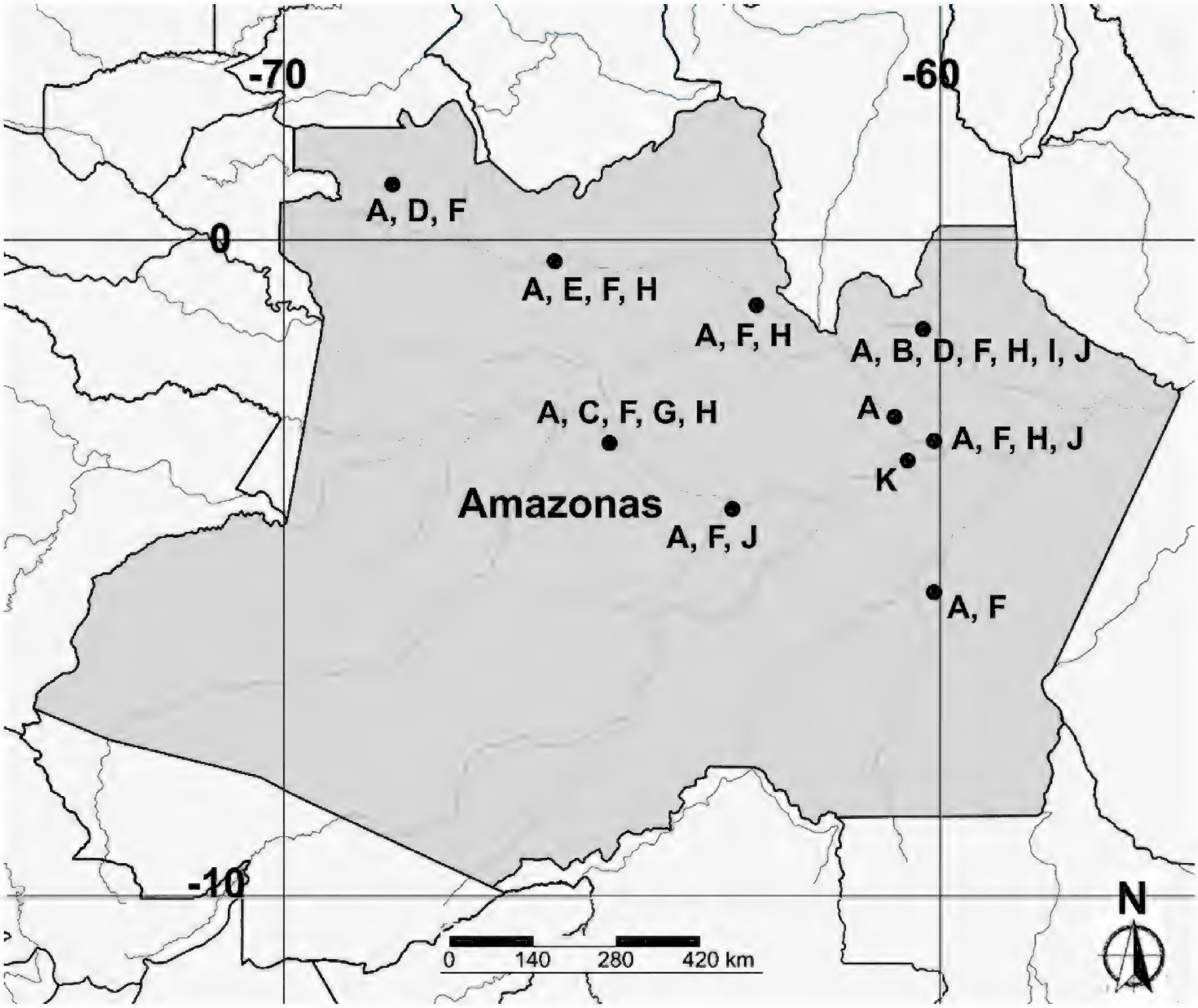

Figure 5. Map of *Culicoides* species distribution in Amazonas State, Brazil. **A.** *C. pseudodiabolicus*. **B.** *C. tidwelli*. **C.** *C. aitkeni*. **D.** *C. baniwa*. **E.** *C. heliconiae*. **F.** *C. hylas*. **G.** *C. pseudoheliconiae*; **H.** *C. verecundus*. **I.** *C. aldomari*. **J.** *C. bricenoi*. **K.** *C. ruizi* (modified after SimpleMappr, http://www.simplemappr.net).

****Culicoides tidwelli*** Spinelli, 1993
(Figures 5, 11J)

Culicoides tidwelli Spinelli *in* Spinelli et al. (1993): 74. Colombia.

Identification: Small wing as shown in figure; proximal antennal segments elongated, about twice as long as broad; halter knob pale (Spinelli et al. 1993). This species is differs from *C. diabolicus* by the the short and rounded palpal segment (definite extension behind tip; palpal segments 4 and 5 slender in *C. diabolicus*), sensilla coeloconica on flagellomeres additional sometimes present on 1, 5, 7, while in *C. diabolicus* the sensilla coeloconica on flagellomeres 1, 9–13 (Spinelli et al. 1993).

Distribution: Honduras to Colombia, Ecuador, and Brazil (Amazonas).

New records: Brazil, Amazonas state, Presidente Figueiredo, Rio Pardo (01°48′ S, 060°19′ W), VI-2010, VIII-2010, 0001-9 (8 females), CDC light traps, peridomicilies, F.A.C. Pessoa collector.

Culicoides travassosi Forattini, 1957

Culicoides travassosi Forattini (1957): 198. Pará, Brazil

Identification: Third palpal segment slender, slightly broader beyond middle, pit subdivided; r-m crossvein dark, two distal pale spots in r_3 (the usual one large, subdivided in some specimens, and a small second near wing tip), two large distal pale spots in cell m1, apices of veins M_1, M_2 and CuA_1 very narrowly pale, apex of vein CuA_2 dark; halter with dark brown knob, pedicel pale (Spinelli et al. 1993).

Distribution: Suriname and Brazil (Amazonas, Pará, and Mato Grosso).

Culicoides verecundus Macfie, 1948
(Figures 5, 11K)

Culicoides verecundus Macfie (1948): 76. Mexico.

Identification: Third palpal segment contains scattered sensilla; mid femur with apical and hind femur

with subapical pale band; wing as shown in figure, r_3 with pale spot present anterior to base of M_1, a single pale spot crossing second radial cell, apices of CuA_1 and CuA_2 dark; spermathecae with short, slender necks. Male tergite 9 with a prominent papilliform process on posterior margin; fused portion of the parameres longer than width; separate portion long and V-shaped at base (Felippe-Bauer et al. 2009).

Distribution: Mexico to Panama; Brazil (Amazonas, Pará, and Roraima).

Subgenus *Mataemyia* Vargas, 1960

Mataemyia Vargas (1960): 43, as subgenus of *Culicoides*. Type species: *Culicoides mojingaensis* Wirth & Blanton, 1953, by original designation.

****Culicoides aldomari*** Felippe-Bauer, Silva & Trindade, 2013
(Figures 5, 11L)

Culicoides aldomari Felippe-Bauer et al. (2013): 56. Pará, Brazil.

Identification: Medium-sized; eyes narrowly separated; flagellomeres 8 and 9 subequal, sensilla coeloconica on flagellomeres 1, 6–8, AR 0.77–0.89; PR 2.0–2.2; wing as figured. This species can be distinguished from *C. azureus* Wirth & Blanton, 1959, *C. barthi* Tavares & Souza, 1978, *C. felippebauerae* Spinelli, 2007, and *C. mojingaensis* Wirth & Blanton, 1953 all subgenus *Mataemyia*, due to the smaller wing, darker lumen of the second radial cell (pale lumen in the others species), by the small dark spot in r_3, located on the distal end of second radial cell (without defined dark spot in *C. barthi,* dark spot behind second radial cell in *C. azureus, C. felippebauerae* and *C. mojingaensis*) and by the flagellomeres without transition in length between proximal and distal series, in the others species the flagellomeres 9–12 are more elongated than 2–8 (Felippe-Bauer et al. 2013).

Distribution: Brazil (Amazonas and Pará).

New record: Brazil, Amazonas state, Presidente Figueiredo, Rio Pardo (01°48′ S, 060°19′ W), VII-2010, 0001-1 (1 female), CDC light traps, forest fragments, F.A.C. Pessoa collector.

Culicoides bricenoi Ortíz, 1915
(Figures 5, 11M)

Culicoides bricenoi Ortíz (1951b): 445. Venezuela.

Identification: Second radial cell long, twice longer than first; r_3 with two large pale spots, the distal one located in distal portion of cell reaching anterodistal wing margin (Felippe-Bauer et al. 2013).

Distribution: Venezuela, Ecuador, Peru, Bolivia, and Brazil (Amazonas, Pará, and Roraima).

***Culicoides* discrepans** Ortíz & Mirsa, 1951
(Figure 6)

Culicoides discrepans Ortíz and Mirsa (1951): 595. Venezuela.

Identification: A large species; wing with distal pale spot in r_3 single, basal pale spot in m_1 large, slightly connected with the basal pale spot in m_2, distal pale spot in m_2 reaching wing margin; one distal pale spot in anal cell, pale spot on M_1 restricted to extreme apex, connected with the distal pale spot in r_3 and m_1 (Felippe-Bauer et al. 2013).

Distribution: Venezuela and Brazil (Amazonas).

Culicoides felippebauerae Spinelli, 2007
(Figure 6)

Culicoides felippebauerae Spinelli *in* Spinelli et al. (2007): 660, Amazonas, Brazil.

Identification: The only species in the subgenus *Mataemyia* with one spermatheca; male with stout, sinuate parameres with filiform tip; posteromedial projection of aedeagus tapered to slender, narrow, blunt tip, with a pair of well developed subapical points (Spinelli et al. 2007).

Distribution: Brazil (Amazonas).

Culicoides wallacei Wirth and & Blanton, 1973
(Figures 6, 11N)

Culicoides wallacei Wirth and Blanton (1973): 449. Pará, Brazil.

Identification: A large species; wing as shown in figure, first and 2nd second radial cells nearly similar in length, distal pale spot in r_3 oblique, broadly reaching wing margin; anal cell with two distal small, round, pale spot (Spinelli et al. 2007).

Distribution: Brazil (Amazonas, Pará, and Maranhão).

Subgenus *Oecacta* Poey, 1853

Oecacta Poey (1853): 238. Type species: *Oecacta furens* Poey, 1853, by monotypy.
Diplosella Kieffer (1921): 113, as subgenus of *Culicoides*. Type species: *Culicoides sergenti* Kieffer, 1921, by monotypy.
Sensiculicoides Shevchenko (1977): 133, as subgenus of *Culicoides*. Type species: *Ceratopogon pictipennis* Staeger, 1839 by original designation.

Culicoides alahialinus Barbosa, 1952
(Figures 6, 11O)

Culicoides alahialinus Barbosa (1952): 11). Ecuador.

Identification: Eyes narrowly separated, bare; third palpal segment moderately swollen, with moderately large, shallow, sensory pit; wing as figured, pale area at wing base and over r-m crossvein; very faint indications of pale spots in cells on distal part of wing; halter infuscated; spermathecae two, slightly, pyriform, slightly unequal (Wirth and Blanton 1959).

Distribution: Costa Rica, Panama, Colombia, Equador, and Brazil (Amazonas).

Subgenus unplaced, *acotylus* species group

Culicoides acotylus Lutz, 1913
(Figures 6, 11P)

Culicoides acotylus Lutz (1913): 69. Mato Grosso, Brazil.
Culicoides panamericanus Fox (1947): 90. Mexico.

Identification: Third palpal segment moderately swollen, without sensory pit, the sensoria scattered on

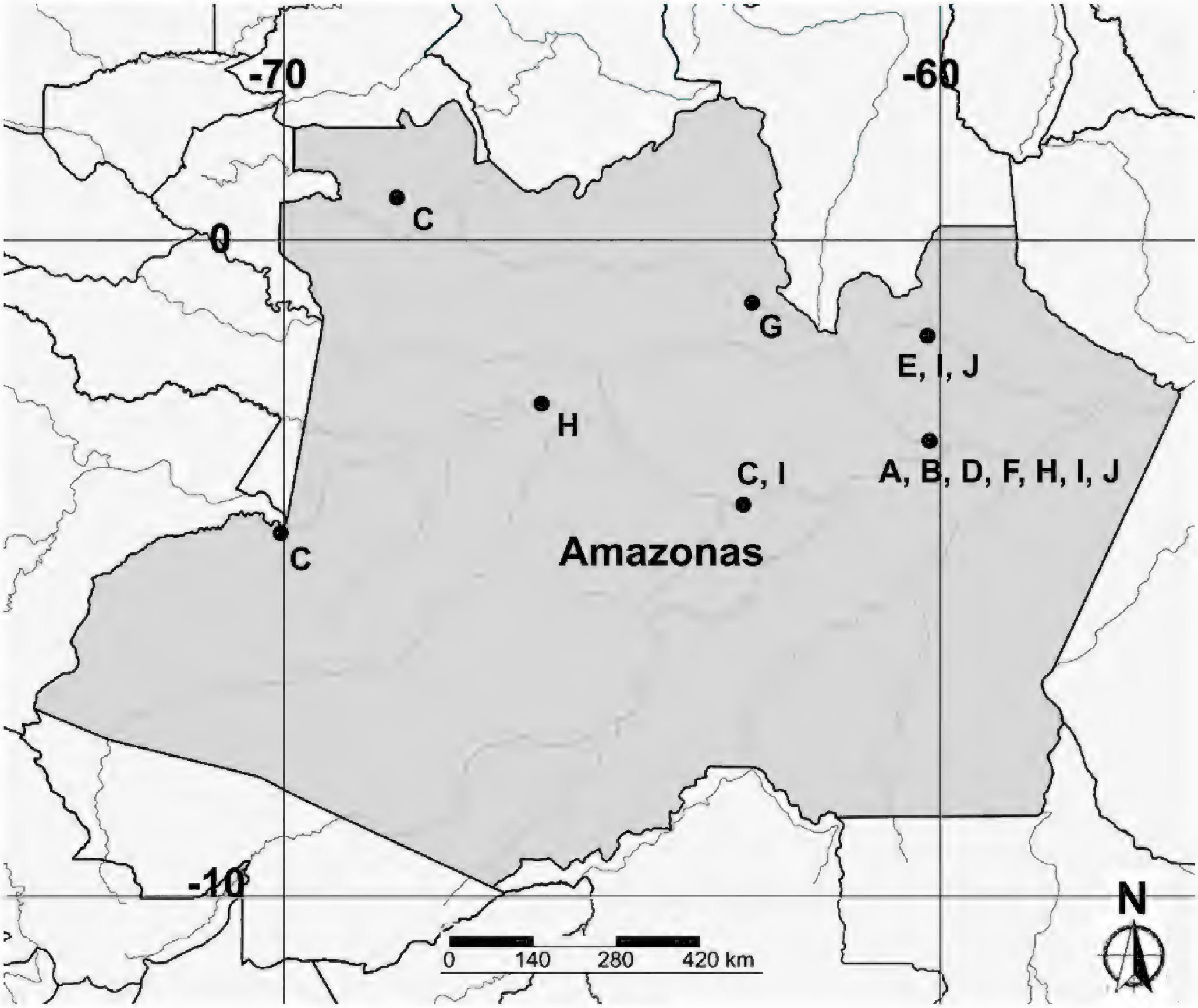

Figure 6. Map of *Culicoides* species distribution in Amazonas State, Brazil. **A.** *C. discrepans*. **B.** *C. felippebauerae*. **C.** *C. wallacei*. **D.** *C. alahialinus*. **E.** *C. acotylus*. **F.** *C.* belemensis. **G.** *C. camposi*. **H.** *C. carpenter*. **I-** *C. dasyophrus*. **J.** *C. eublepharus* (modified after SimpleMappr, http://www.simplemappr.net).

surface of segment; wing as figured, second radial cell very dark, r-m crossvein blackish, in the center of a large pale spot which broadly reaches costal margin, cell r_3 with five definite pale spots, apices of veins M_1 and M_2 pale margined a short distance, a pale spot each in apex of cell m_2 and cell CuA_1, neither attaining wing margin, two pale spots in distal portion of anal cell and two in basal portion of this cell; cell m_2 with a pale spot lying in front of mediocubital fork, a lying behind medial fork and another lying across cell about halfway from these spots and wing base; halter pale; spermathecae two, pyriform, slightly unequal, the bases of the ducts sclerotized a short distance (Wirth and Blanton 1959).

Distribution: Mexico, Honduras, Panama, Venezuela, Trinidad, Suriname, and Brazil (Amazonas, Pará, Roraima, and Mato Grosso).

Subgenus unplaced, *carpenteri* species group

Culicoides belemensis Wirth & Blanton, 1973
(Figures 6, 11Q)

Culicoides belemensis Wirth and Blanton (1973): 427. Pará, Brazil.

Identification: Eyes narrowly separated, bare; third segment only slightly swollen with small, round, shallow, sensory pit on distal; wing as figured; halter brownish; spermathecae two, ovoid, unequal; aedeagus with disti-median process moderately slender with parallel sides and blunt, concaved tip; parameres with distinct ventral swelling ending in a distal lobe, apical portion slender, bearing lateral spines and terminating in a filiforme tip (Wirth and Blanton 1973).

Distribution: Brazil (Amazonas, Pará) and Colombia.

Culicoides camposi Ortíz & León, 1955
(Figure 6)

Culicoides camposi Ortíz and León (1955): 569. Ecuador.
Culicoides fairchildi Wirth and Blanton (1955): 102. Panama.

Identification: Third palpal segment swollen, with a broad, shallow, irregular sensory pit; second radial cell very dark; pale spot over r-m crossvein broadly reaching costal margin, distal pale spot in cell r_3 rounded, almost reaching anterior wing margin, distal pale spot in cell m_1 elongate and nearly reaching wing margin, two pale spots, which may be more or less fused, in distal part of anal cell; base of anal cell pale; cell m_2 with a small pale spot lying in front of mediocubital fork and a pale area extending from behind medial fork to base of wing; halter yellowish (Wirth and Blanton 1959).

Distribution: Costa Rica, Panama, Colombia, Ecuador, and Brazil (Amazonas).

Culicoides carpenteri Wirth & Blanton, 1953
(Figure 6)
Culicoides carpenteri Wirth and Blanton (1953): 72. Panama

Identification: Third palpal segment scarcely swollen, with a broad, shallow, sensory pit; second radial cell very dark, large pale area over r-m crossvein, distal pale spot in cell r_3 extensive, broadly extending across cell near apex from anterior wing margin to vein M_1; apices of veins M_1, M_2 and CuA_1 dark; subapical pale spot in cell m_2, distal pale spot in cell m_1 broadly meeting wing margin; two pale spots in distal part of cell m_2, the distal one broadly meeting wing margin; the proximal one connected by a pale area extending to base of cell and including the pale spots lying in front of mediocubital fork and behind medial fork; pale area in cell CuA_1 nearly filling entire cell; anal cell pale except for a large dark area centering on middle of stem of mediocubital vein; halter pale (Wirth and Blanton 1959).

Distribution: Panama and Brazil (Amazonas).

Subgenus unplaced, *dasyophrus* species group

Culicoides dasyophrus Macfie, 1940
(Figures 6, 11R)
Culicoides dasyophrus Macfie (1940): 27. Guyana.

Identification: Eyes narrowly separated above, with long interfacetal hairs; third palpal segments swollen, with a broad, shallow, sensory pit; wing as shown in figure, poststigmatie pale spots in cell r_3 more or less fused, the posterior one located slightly proximad of the anterior one, distal pale spot in cell r_3 small, only one small pale spot in distal part of anal cell and one pale spotin distal part of cell m_2; halter whitish; spermatheca one, pyriform (Wirth and Blanton 1956).

Distribution: Colombia, Venezuela, Ecuador, Guyana, and Brazil (Amazonas, Pará, Roraima, and Mato Grosso).

Subgenus unplaced, *eublepharus* species group

Culicoides eublepharus Macfie, 1948
(Figures 6, 48S)
Culicoides eublepharus Macfie (1948): 86. Guyana.
Culicoides transferrans Ortíz (1953): 801. Venezuela.

Identification: Eyes narrowly separated, with long interfacetal hairs; third palpal segment moderately swollen, with a broad, shallow, sensory pit; wing as shown in figure, with four pale spots in a rhomboid in cell r_3, the distal pair usually fused and broadly attaining wing margin anteriorly; two pale spots each in cells m_1 and apices of cells m_2 and anal cell; pale spots present behind medial fork and in front of mediocubital fork; halter yellowish; spermatheca one, oval with a short portion of the duct sclerotized (Wirth and Blanton 1959).

Distribution: Mexico, Costa Rica to Venezuela and Ecuador, and Brazil (Amazonas, Pará, and Roraima).

Culicoides propriipennis Macfie, 1948
(Figures 7, 11T)
Culicoides propriipennis Macfie (1948): 84. Mexico.

Identification: This species is most similar to *C. tetrathyris*, but *C. propriipennis* can easily be distinguished by the presence of a third pale spot at the wing margin in cell m_1, by the second pale spot in the distal portion of cell m_2, wing as figured (Wirth and Blanton 1959).

Distribution: Mexico to Panama, Venezuela, Ecuador, and Brazil (Amazonas, Pará, and Bahia).

Culicoides rangeli Ortíz & Mirsa, 1952
(Figure 7)
Culicoides rangeli Ortíz and Mirsa (1952): 126. Venezuela.
Culicoides donajii Vargas (1954): 28. Mexico.
Culicoides patulipalpis Wirth and Blanton (1959): 421. Panama.

Identification: Eyes nearly contiguous, with long interfacetal hairs; third segment swollen, with a very broad, shallow, sensory pit, open and without regular pore; posterior poststigmatic pale spot in cell r_3 very small or entirely absent, distal spot in cell r_3 transverse and not double, not attaining wing margin; two very small pale spots each in cell m_1 and in apices of cell m_2 and anal cell; a pale spot present behind medial fork and another in front of mediocubital fork; halter pale; spermatheca one, pyriform, with long sclerotized neck (Wirth and Blanton 1959).

Distribution: Mexico to Venezuela, Trinidad, Ecuador, Bolivia, and Brazil (Amazonas).

Subgenus unplaced, *fluvialis* species group

Culicoides fluvialis Macfie, 1940 (Figures 7, 11U)
Culicoides fluvialis Macfie (1940): 25. Guyana.

Identification: Third palpal segment short and slightly swollen, with a small, deep sensory pit; wing as shown in figure, with second radial cell moderately dark, cell r_3 with two separate round poststigmatic pale spots, the posterior one located behind second radial cell, the distal pale spot hourglass-shaped on wing margin, apices of veins M_1 and M_2 with a small pale spot at wing margin, cell CuA_1 with a round pale spot almost meeting

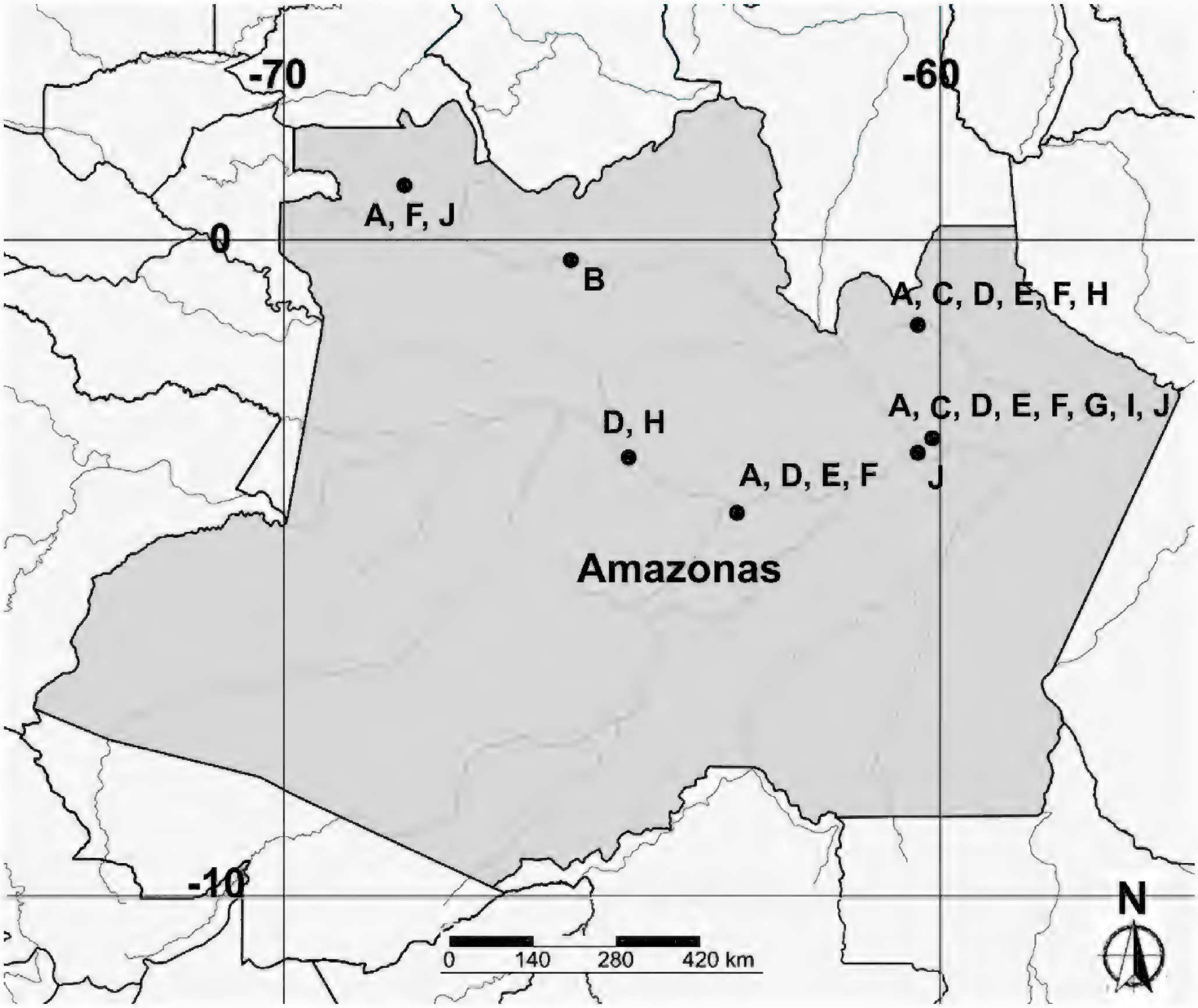

Figure 7. Map of *Culicoides* species distribution in Amazonas State, Brazil. **A.** *C. propriipennis*. **B.** *C. rangeli*. **C.** *C. fluvialis*. **D.** *C. leopoldoi*. **E.** *C. tetrathyris*. **F.** *C. benarrochi*. **G.** *C. fieldi*. **H.** *C. glabellus*. **I.** *C. leoni* **J.** *C. galindoi* (modified after SimpleMappr, http://www.simplemappr.net).

wing margin, only one small round pale spot in distal part of anal cell, cell m_2 with a small pale spot present lying behind medial fork; halter pale; spermathecae two, oval, slightly unequal (Wirth and Blanton 1959).

Distribution: Honduras to Colombia, Venezuela, Trinidad, Guyana, and Brazil (Amazonas, Pará, and Roraima).

Culicoides leopoldoi Ortíz, 1951
(Figures 7, 12A)

Culicoides leopoldoi Ortíz (1951a): 579. Venezuela.

Identification: Wing as figured, with pale spot on crossvein r-m extensive; pale spot present behind second radial cell, proximal to the poststigmatic pale spots; poststigamtic pale spots longitudinally aligned, posterior one smaller; distal pale spot in cell r_3 large, with narrow proximal extension; one spermatheca (Spinelli et al. 2005).

Distribution: Guatemala and Belize to Bolivia, northeastern Argentina, Trinidad, and Brazil (Amapá, Amazonas, Pará, Rondônia, Roraima, Bahia, Ceará, Maranhão, Pernambuco, Espírito Santo, Minas Gerais, and Rio de Janeiro).

Culicoides tetrathyris Wirth & Blanton, 1959
(Figures 7, 12B)

Culicoides tetrathyris Wirth and Blanton (1959): 409. Panama.

Identification: Resembling *C. propriipennis* in wing pattern, mesonotal and leg markings, structural characters, and male genitalia, but *C. propriipennis* differs by having the sides of the mesonotum brownish instead of bluish pruinose, a third pale spot in cell m_1 at the wing margin, the pale spots in cell r_3 arranged in a rhomboid instead of a trapezoid, distal sensory tufts in falgellomeres 1, 7–12, and the pit on the third palpal segment broader. The male genitalia of the two species are practically identical, but in *C. propriipennis* the stem of the paramere is stouter and not bent near the base (Wirth and Blanton 1959).

Distribution: Honduras, Costa Rica, Panama, Ecua-

dor, Suriname, Trinidad, and Brazil (Acre, Amazonas, Pará, Roraima, and Bahia).

Subgenus unplaced, *leoni* species group

Culicoides benarrochi Ortíz & Mirsa, 1952
(Figures 7, 12C)
Culicoides benarrochei [*sic*] Ortíz and Mirsa (1952): 126. Venezuela.

Identification: Wing as figured; separated from *C. fieldi* by its shorter second palpal segment (9/13 as long as third segment), flagellomeres 9–11 and 12 subequal in length and by the presence of a distinct pale spot in front of the mediocubital fork (Wirth and Blanton 1959.

Distribution: Venezuela, Trinidad, and Brazil (Amazonas, Roraima, and Rio de Janeiro).

Culicoides fieldi Wirth & Blanton, 1956
(Figure 7)
Culicoides fieldi Wirth and Blanton (1956): 50. Honduras.

Identification: Eyes contiguous, with long interfacetal hairs; third segment moderately swollen, with a small, deep, sensory pit; pale spot over r-m crossvein small, poststigmatic pale spots in cell r_3 more or less separated into two distinct, distal pale spot in cell r_3 small and round in center of cell, two pale spots in cell m_1, only one pale spot each in apices of cells m_2, CuA_1 and anal cell, pale spot present behind medial fork; halter infuscated; spermatheca one, pyriform (Wirth and Blanton 1959).

Distribution: Costa Rica, Honduras, Panama, and Brazil (Amazonas, Pará, and Rio de Janeiro).

Culicoides glabellus Wirth & Blanton, 1956
(Figures 7, 12D)
Culicoides glabellus Wirth and Blanton (1956): 47. Panama.

Identification: General appearance, size, and wing markings practically identical to *C. leoni* Barbosa, 1952 and *C. gabaldoni* Ortíz, 1954. There are two spermathecae but in *C. gabaldoni* and *C. leoni* differs by having an antennal ratio of only 0.75 and sensoria present in flagellomere 1, 5, and 6–8. The male genitalia of *C. glabellus* is distinguished by the gradually curving base of the paramere, the swollen stem at the distal part of the straight portion, beyond which the paramere tapers rapidly to a simple, filamentous tip (Wirth and Blanton 1959).

Distribution: Honduras to Panamá, Ecuador, Trinidad, and Brazil (Amazonas, Pará, Roraima, and Bahia).

Culicoides leoni Barbosa, 1952 (Figure 7)
Culicoides leoni Barbosa (1952): 17 Ecuador.

Identification: Sensilla coeloconica on flagellomeres 1, 5–8; wing length 0.63 mm, wing pattern with the caudal extension of the post-stigmatic pale spot not oblique in cell r_3 and usually connected to vein M_1, smaller pale spot on r-m crossvein, one pale spot in cell M_1 near base, and distal pale spot in anal cell abutting wing margin (Huerta et al. 2012).

Distribution: Brazil (Amazonas) and Ecuador.

Subgenus unplaced, *limai* species group

Culicoides antunesi Forattini, 1954
Culicoides antunesi Forattini (1954b): 315. Goiás, Brazil.

Identification: Eyes narrowly separated, bare; third segment slightly swollen, with a small, deep, sensory pit; sensilla in flagellomeres 1, 5–8 and antennal ration greater than 1; halter pale; species resembles *C. lobatoi* Fellipe-Bauer 1994, *C. limai* Barretto, 1954 and *C. boliviensis* Spinelli and With, 1984 by general aspects of the wings. *Culicoides antunesi*, *C. lobatoi* and *C. boliviensis* have similar pale markings on all legs while *C. limai* presents an additional pale spot on subapical portion of hind femur (Forattini 1957; Felippe-Bauer and Quintelas 1994).

Distribution: Brazil (Amazonas, Goiás, Mato Grosso do Sul, Minas Gerais, and São Paulo).

Culicoides galindoi Wirth & Blanton, 1953
(Figures 7, 12E)
Culicoides galindoi Wirth and Blanton (1953): 73. Panama.

Identification: Eyes contiguous, bare; third segment slightly swollen, with a small, shallow, sensory pit; have the pale distal spot in cell r_3 rounded distally, leaving a small dark area in apex of cell; halter pale; spermathecae two, pyriform, subequal (Wirth and Blanton 1959).

Distribution: Costa Rica, Panama, and Brazil (Acre, Amazonas, Roraima, and Maranhão).

Culicoides limai Barretto, 1944
(Figures 8, 12F)
Culicoides limai Barretto (1944): 99. São Paulo, Brazil.

Identification: Small; the much broader third palpal segment; wing as shown in figure, with distal pale spot in cell m_1 broadly abutting wing margin, second radial wholly included in a dark spot, no pale spot straddling vein M_2, this vein usually dark to apex, apices of veins M_1, M_2 dark; subapical pale band on the hind femur and pale apex of the hind tibia; presence of a small ventral lobe on the male parameres (Wirth and Blanton 1959).

Distribution: El Salvador to Ecuador, northeastern Argentina, and Brazil (Amapá, Amazonas, Pará, Roraima, Maranhão, Mato Grosso do Sul, Minas Gerais, Rio de Janeiro, São Paulo, and Santa Catarina).

Culicoides lopesi Barretto, 1944
(Figures 8, 12G)
Culicoides lopesi Barretto (1944): 102. São Paulo, Brazil.

Identification: Wing nearly identical with that of *C. almirantei* Wirth & Blanton, 1959, wing as figured, but the genitalia are different, with a tapering ninth tergum, aedeagus with slender basal arms and slender apex, and parameres with a low ventral lobe and subapical barbs (Wirth and Blanton 1959).

Distribution: Panama, Suriname, and Brazil (Acre, Amazonas, Rio de Janeiro, and São Paulo).

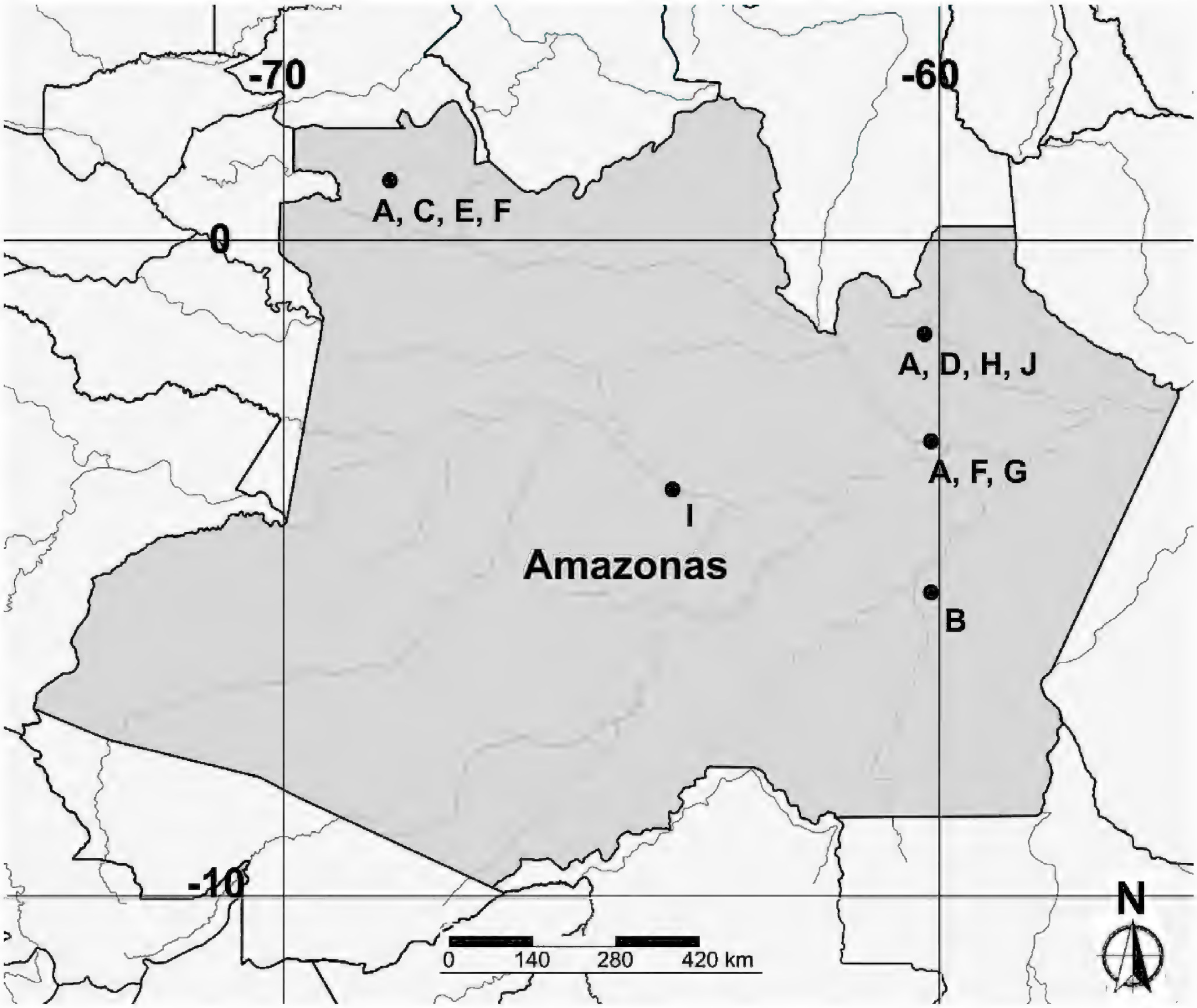

Figure 8. Map of *Culicoides* species distribution in Amazonas State, Brazil. **A.** *C. limai*. **B.** *C. lopesi*. **C.** *C. santanderi*. **D.** *C. vernoni*. **E.** *C. caprilesi*. **F.** *C. pachymerus*. **G.** *C. aureus*. **H.** *C. castelloni*. **I.** *C. fittkaui*. **J.** *C. guamai* (modified after SimpleMappr, http://www.simplemappr.net).

Culicoides santanderi Browne, 1980
(Figure 8)
Culicoides santanderi Browne (1980): 536. Colombia.

Identification: Eyes narrowly separated, bare; third segment cone-shaped with deep circular sensory pit; sensory pattern in flagelomeres 1, 5–8; halter pale; two spermathecae, subequal, with ducts sclerotized a considerable distance. Antennal proportion, distribution of sensoria, and overall wing pattern place *C. santanderi* within the *limai* group. This species is distinguished from others in that group by the divided poststigmatic pale spot, the posterior one larger and extending proximal to the anterior one (Browne 1980).

Distribution: Brazil (Amazonas) and Colombia.

Culicoides vernoni Wirth & Blanton, 1973
(Figures 8, 12H)
Culicoides vernoni Wirth and Blanton (1973): 448. Pará, Brazil.

Identification: Wing as figured, distal pale spot in cell r_3 large, filling apex of cell with dark area boadering tip of vein M_1 very little expanded apically; fore and mid femora with suapical and all tibiae with sub-basal, narrow pale rings. This species has a nearly identical wing pattern to *C. limai* and *C. galindoi*, but in both related species the distal pale spot in cell r_3 is rounded distally leaving a sizeable dark area at apex of cell. *Culicoides limai* has male genitalia nearly identical with *C. vernoni*, but the hind femur has a distinct subapical pale ring. *Culicoides galindoi* has the hind femur dark to tip, but the male parameres lack the ventral lobe (Wirt and Blanton 1973).

Distribution: Costa Rica, Colombia, Bolivia, and Brazil (Amazonas and Pará).

Subgenus unplaced, *pachymerus* species group

Culicoides caprilesi Fox, 1952
(Figure 8)
Culicoides caprilesi Fox (1952): 364. Venezuela.

Culicoides kintzi Wirth and Blanton (1953): 72. Panama.

Identification: Distinguished in pinned mounts by the greater development of the dark mesonotal striae and the much hairier wing on which the dark color pattern is more extensive, dark mark extending from the base of the second radial cell almost to its apex and extending over into cell r_3 as a small rounded dark spot just behind the tip of the second radial cell. In some specimens, the latter dark spot is narrowly connected to the next distal dark area (Wirth and Blanton 1959).

Distribution: Colombia, Panama, Venezuela, ad Brazil (Amazonas, Pará, and Mato Grosso).

Culicoides pachymerus Lutz, 1914
(Figure 8)
Culicoides pachymerus Lutz (1914): 83. –Amazonas, Brazil.

Identification: Smaller than *C. uniradialis* Wirth & Blanton, 1953 and *C. caprilesi*, its wing is less hairy than that of *C. caprilesi*, there is no dark spot or connection immediately posterior to the end of the second radial cell as in *C. caprilesi*. The male genitália of *C. pachymerus* closely resemble those of *C. uniradialis*, with a long ventral lobe present on the parameres, but differing in having a median notch on the ninth tergum, aedeagal arch much broader with slender basal arms and no barbs on the tips of the parameres (Wirth and Blanton 1959).

Distribution: Guatemala to Colombia and Brazil (Amazonas).

Subgenus unplaced, *reticulatus* species group

Culicoides aureus Ortíz, 1951
(Figures 8, 12I)
Culicoides aureus Ortíz (1951a): 585. Venezuela.
C. miyamotoi Wirth and Blanton (1953): 231. Panama.

Identification: Wing as figured, r_3 with five pale spots in the proximal half of cell; m_1 with two pale spots, the distal one far from wing margin; AR 0.72–0.76; proboscis short, P/H ratio 0.61–0.70; male with sternite 9 with slightly perceptible posteromedial excavation; aedeagus with basal arch extending to 0.3 of total length; parameres without ventral lobes, distal portion curved, apex flattened (Santarém et al. 2015).

Distribution: Panama, Venezuela, Bolivia, Paraguay, Argentina, and Brazil (Amazonas and Goiás).

Culicoides castelloni Santarém & Felippe-Bauer, 2015
(Figure 8)
Culicoides castelloni Santarém and Felippe-Bauer (2015): 959. Amazonas, Brazil.

Identification: The only species of the *reticulatus* group with sensilla coeloconica on flagellomeres 1 and 9–13 and a tibial comb with six spines (sensilla coeloconica 1, 5–8 or 1, 6–8 and tibial comb with 4 or 5 spines in other species of the group). Third palpal segment long (PR 4.2) with a small, rudimentary sensory pit (PR 1.6–3.2, with variable sensory pit, in other species of the group). The female of *C. castelloni* has similar wing pattern to *C. reticulatus*, but distinguished by the characters described above and by the presence of two parallel, longitudinal, admedian pale spots, anterior to the prescutellar depression, in *C. reticulatus* with four median anterior yellowish spots arranged as a leaf clover (Santarém et al. 2015).

Distribution: Brazil (Amazonas).

Culicoides fittkaui Wirth & Blanton, 1973
(Figures 8, 12J)
Culicoides fittkaui Wirth and Blanton 1973: 432. Pará, Brazil.

Identification: Eyes nearly contiguous; proboscis short, P/H ratio 0.60–0.63; hind femur dark; wing as shown in figure, with pale spots of the wing interconnected, r_3 with two pale spots, second radial cell with pale lumen, m_1 with two pale spots, the distal one reaching wing margin; aedeagus in male with basal arch extending half of total length; parameres with large ventral lobes, apical portion with lateral fringe of spicules (Santarém et al. 2015).

Distribution: Brazil (Amazonas and Pará).

****Culicoides guamai*** Wirth & Blanton, 1973
(Figures 8, 12K)
Culicoides guamai Wirth and Blanton (1973): 438. Pará, Brazil.

Identification: Proboscis short, P/H ratio 0.71–0.79; hind femur dark; wing as figured, with pale spots of the wing interconnected, r_3 with two pale spots, m_1 with two pale spots, the distal one reaching wing margin, second radial cell short, with dark lumen; aedeagus in male with basal arch extending to 0.6 of total length; parameres with a strong ventral swelling on proximal portion of stem, distal portion with filamentous tip with fringing spines (Santarém et al. 2015).

Distribution: Brazil (Amazonas and Pará).

New record — Brazil, Amazonas state, Presidente Figueiredo, Rio Pardo (01°48′ S, 060°19′ W), VI-2010, VIII-2010, 0001-6 (2 females), CDC light traps, forest fragments, F.A.C. Pessoa collector.

Culicoides hildebrandoi Farias, Pereira Junior, Felippe-Bauer, Pessoa, Medeiros and Santarém, 2016
(Figures 9, 12L)
Culicoides hildebrandoi Farias et al. (2016): 107 Amazonas and Rondônia, Brazil.

Identification: Second radial cell in dark spot, r_3 with four sparsely distributed pale spots, r-m crossvein pale; hind femur with subapical pale band; scutum with two anterior submedian clover-leaf shaped spots; 3rd palpal segment elongate, slightly swollen, cylindrical, without a sensory pit but with capitate sensilla scattered on the surface cuticle; tergite 9 of male with a posteromedial notch, parameres with slightly sinuous stem, swollen on mid-portion and without a ventral lobe and the basal

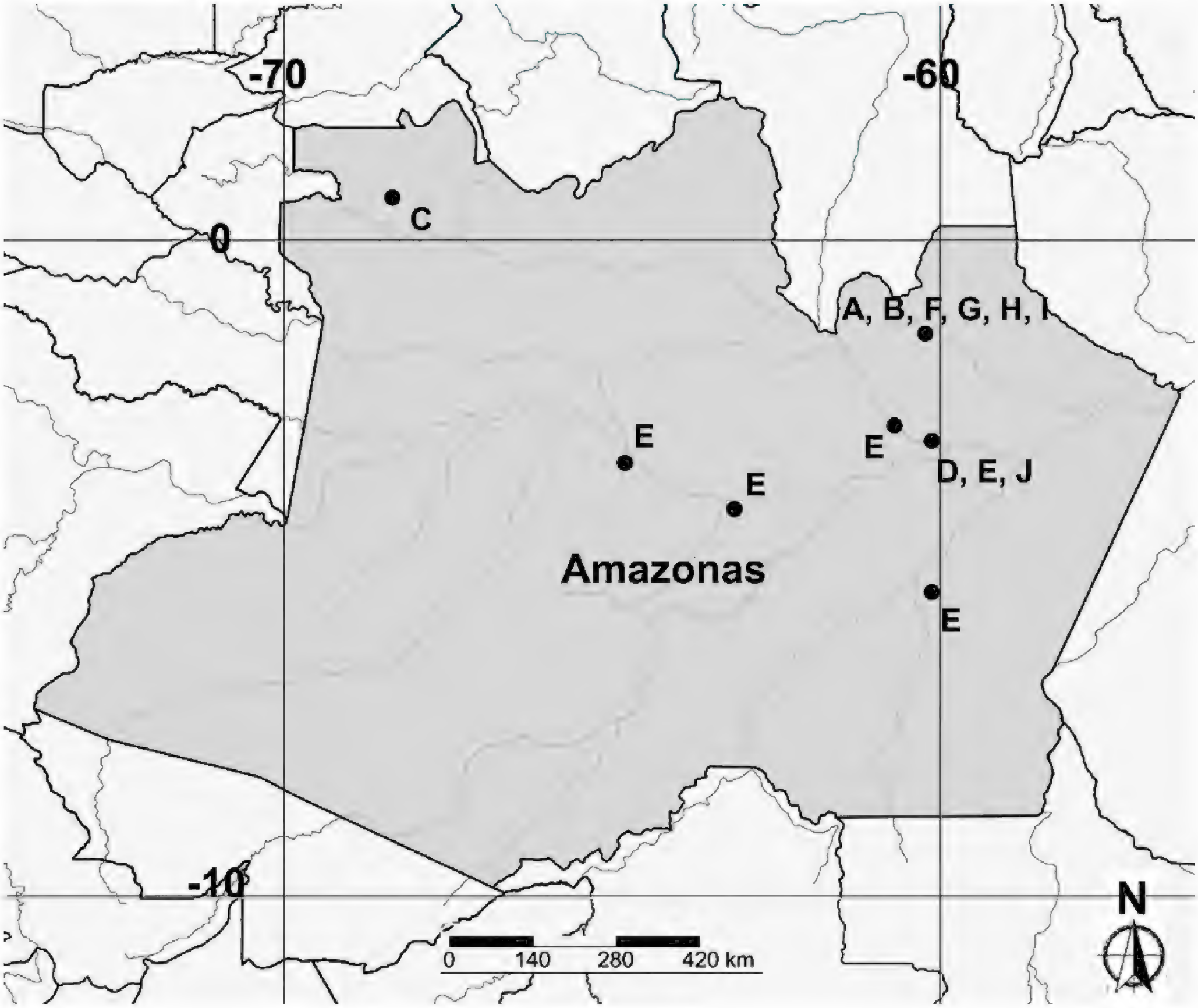

Figure 9. Map of *Culicoides* species distribution in Amazonas State, Brazil. **A.** *C. hildebrandoi*. **B.** *C. irregularis*. **C.** *C. kuripako*. **D.** *C. lanei*. **E.** *C. paucienfuscatus*. **F.** *C. profundus*. **G.** *C. pseudoreticulatus*. **H.** *C. rhombus*. **I.** *C. fluviatilis*. **J.** *C. wokei* (modified after SimpleMappr, http://www.simplemappr.net).

arch of aedeagus extending two-thirds of total length.

Distribution: Brazil (Amazonas and Rondonia).

Culicoides irregularis Santarém, Felippe-Bauer & Castellón, 2014
(Figures 9, 12M)

Culicoides irregularis Santarém, Felippe-Bauer and Castellón *in* Santarém et al. (2014): 265. Roraima, Brazil.

Identification: Third palpus segment with a multiple, shallow, irregular sensory pit, PR 2.0–2.9; moderately long proboscis, P/H ratio 0.80–0.94; mandible with 16 teeth; scutum with four median anterior yellowish spots arranged as a leaf clover; wing as shown in figure, r_3 with four pale spots, m_1 with two pale spots; two unequal ovoid spermathecae (Santarém et al. 2015).

Distribution: Brazil (Amazonas and Roraima).

Culicoides kuripako Felippe-Bauer, 2010
(Figure 9)

Culicoides kuripako Felippe-Bauer *in* Felippe-Bauer et al. (2010): 863. Amazonas, Brazil.

Identification: Pale spots of the wing interconnected; r_3 with two pale spots, postigmatic pale spot inverted L-shaped, isolating a dark spot behind second radial cell; m_1 with two pale spots, the distal one reaching wing margin; CuA_1 and CuA_2 pale. Male: sternite 9 with deep posteromedial excavation; aedeagus with basal arch extending to half of total length; parameres with ventral lobes, distal portion with lateral fringe of spicules (Santarém et al. 2015).

Distribution: Brazil (Amazonas and Pará).

Culicoides lanei Ortíz, 1950
(Figures 9, 12N)

Culicoides lanei Ortíz (1950b): 431. Panama.

Identification: Proboscis short, P/H ratio 0.63–0.66; AR 0.72–0.78; wing as figured, r_3 with five pale spots, m_1 with three pale spots, the distal one near wing margin; hind

femur dark, hind tibia dark apically; aedeagus in male with basal arch extending to half the total length; parameres with blade-like ventral lobes, distal portion with lateral fringe with fine spicules (Santarém et al. 2015).

Distribution: Mexico, Honduras, Costa Rica, Panama, Venezuela, Trinidad, and Brazil (Amazonas, Pará and Roraima).

Culicoides paucienfuscatus Barbosa, 1947
(Figures 9, 12O)

Culicoides paucienfuscatus Barbosa (1947): 23. –Amazonas, Brazil.

Identification: Wing as figured, with pale spots of the wing interconnected; r_3 with two pale spots, post-stigmatic pale spot inverted L-shaped, isolating a dark spot behind second radial cell; m_1 with two pale spots,

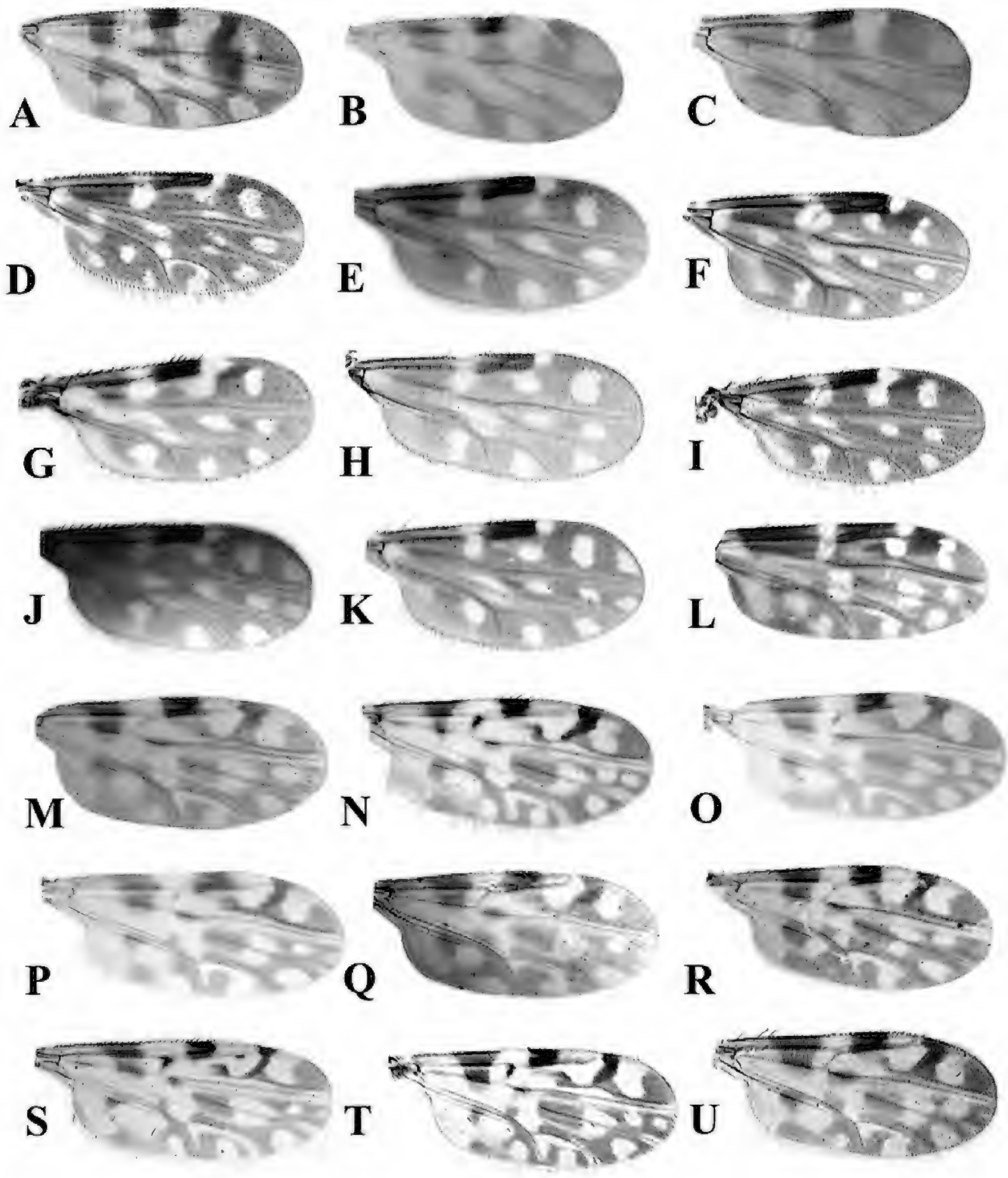

Figure 10. Wing photograph of *Culicoides* species in Amazonas State, Brazil. **A.** *C. efferus*. **B.** *C. pusilloides*. **C.** *C. pusillus*. **D.** *C. freitasi*. **E.** *C. debilipalpis*. **F.** *C. glabrior*. **G.** *C. insinuatus*. **H.** *C. spurius*. **I.** *C. todatangae*. **J.** *C. paraensis*. **K.** *C. quasiparaensis*. **L.** *C. baniwa*. **M.** *C. batesi*. **N.** *C. brownei*. **O.** *C. coutinhoi*. **P.** *C. diabolicus*. **Q.** *C. filariferus*. **R.** *C. flavivenulus*. **S.** *C. foxi*. **T.** *C. franklini*. **U.** *C. fusipalpis*.

the distal one reaching wing margin; CuA_1 pale and CuA_2 dark (Santarém et al. 2015).

Distribution: Costa Rica to Peru, Venezuela, Trinidad, Brazil (Acre, Amazonas, Pará, Roraima, Maranhão, Goiás) and Bolivia.

Culicoides profundus Santarém, Felippe-Bauer and & Trindade, 2014
(Figures 9, 12P)

Culicoides profundus Santarém, Felippe-Bauer and Trindade *in* Santarém et al. (2014): 266. Pará, Brazil.

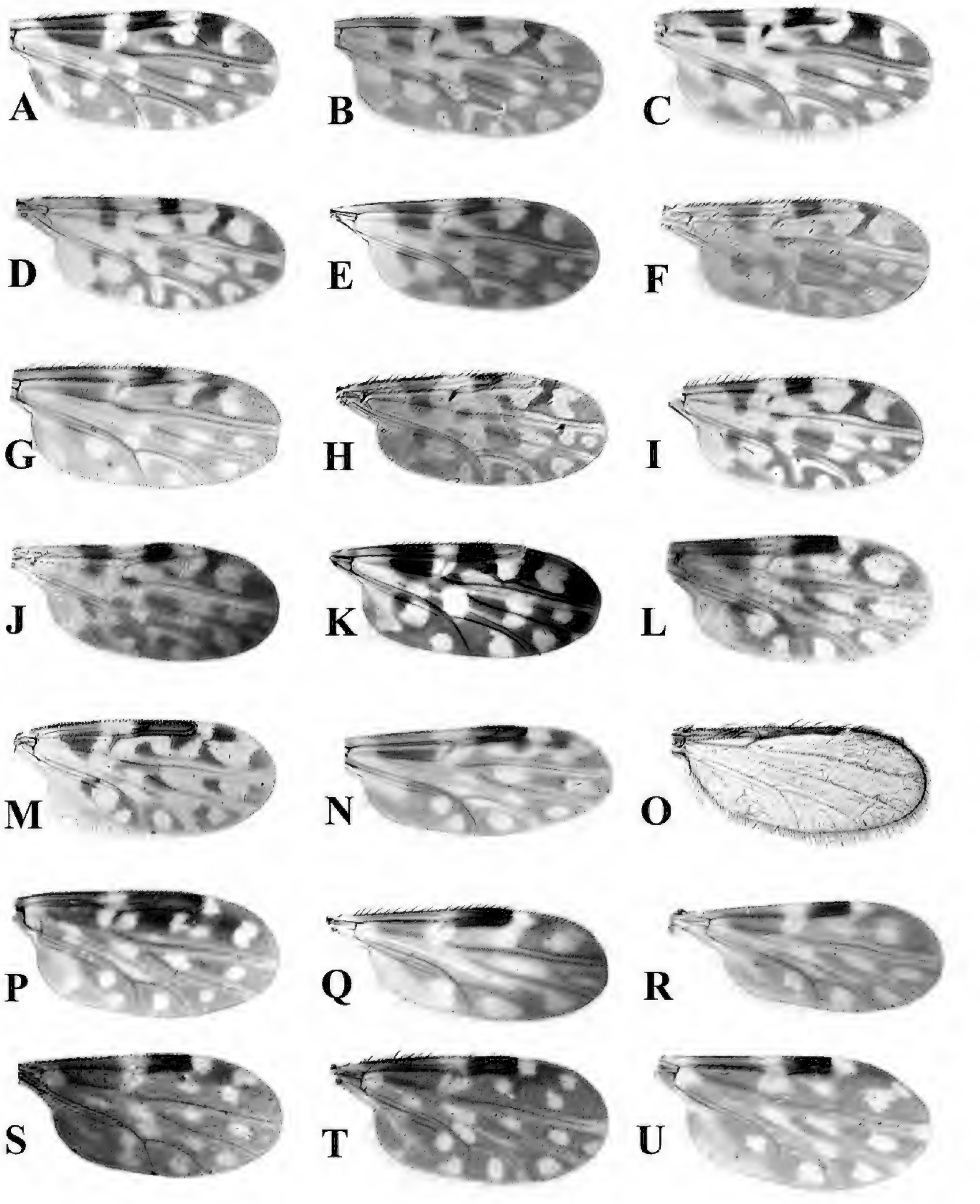

Figure 11. Wing photograph of *Culicoides* species in Amazonas State, Brazil. **A.** *C. hylas*. **B.** *C. ignacioi*. **C.** *C. insignis*. **D.** *C. lutzi*. **E.** *C. ocumarensis*. **F.** *C. paraignacioi*. **G.** *C. paramaruim*. **H.** *C. plaumanni*. **I.** *C. pseudodiabolicus*. **J.** *C. tidwelli*. **K.** *C. verecundus*. **L.** *C. aldomari*. **M.** *C. bricenoi*. **N.** *C. wallacei*. **O.** *C. alahialinus*. **P.** *C. acotylus*. **Q.** *C. belemensis*; **R.** *C. dasyophrus*. **S.** *C. eublepharus*. **T.** *C. propriipennis*. **U.** *C. fluvialis*.

Identification: Third palpal segment swollen, with large, deep sensory pit in middle portion, opening in a small, rounded pore, PR 1.8–2.4; moderately long proboscis, P/H ratio 0.86–0.95; mandible with 16 teeth; scutum with four median anterior yellowish spots arranged as a leaf clover; wing as shown in figure, r_3 with four pale spots, m_1 with two pale spots, the distal one far from wing margin (Santarém et al. 2015).

Distribution: Brazil (Amazonas and Pará).

Culicoides pseudoreticulatus Santarém, Felippe-Bauer & Castellón, 2014
(Figures 9, 12Q)

Culicoides pseudoreticulatus Santarém, Felippe-Bauer and Castellón *in* Santarém et al. (2014): 268. Roraima, Brazil.

Identification: Scutum with four median anterior yellowish spots arranged as a leaf clover; third palpal segment with a shallow, round sensory pit in middle portion, with no well-defined contours on distal half, PR

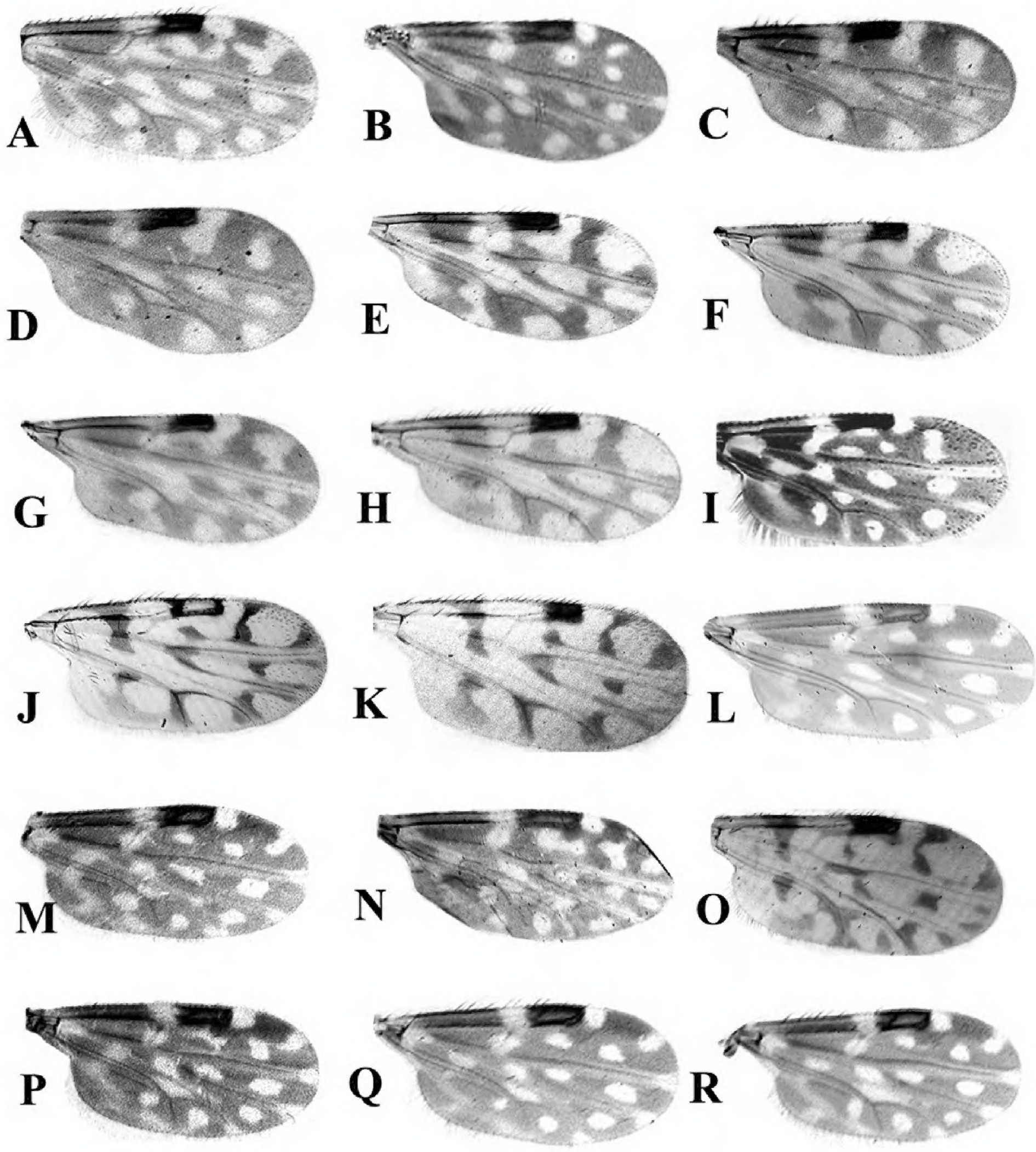

Figure 12. Wing photograph of *Culicoides* species in Amazonas State, Brazil. **A.** *C. leopoldoi*. **B.** *C. tetrathyris*. **C.** *C. benarrochi*. **D.** *C. glabellus*. **E.** *C. galindoi*. **F.** *C. limai*. **G.** *C. lopesi*. **H.** *C. vernoni*. **I.** *C. aureus*. **J.** *C. fittkaui*. **K.** *C. guamai*. **L.** *C. hildebrandoi*. **M.** *C. irregularis*. **N.** *C. lanei*. **O** *C. paucienfuscatus* **P.** *C. profundus*. **Q.** *C. pseudoreticulatus*. **R.** *C. rhombus*.

2.0–2.7; proboscis moderately long, P/H ratio 1.0–1.06; mandible with 19 teeth; wing as figured, r_3 with four pale spots; m_1 with two pale spots, the distal one far from wing margin (Santarém et al. 2015).

Distribution: Brazil (Amazonas and Roraima).

Culicoides rhombus Santarém, Felippe-Bauer & Castellón, 2014
(Figures 9, 12R)

Culicoides rhombus Santarém, Felippe-Bauer and Castellón *in* Santarém et al. (2014): 270. Roraima, Brazil.

Identification: Third palpal segment rhomboid, with a shallow, well-developed irregular sensory pit that reaches the extreme distal portion of segment, PR 2.5–3.0; proboscis long; P/H ratio 1.08–1.28; scutum with four median anterior yellowish spots arranged as a leaf clover; wing as figured, r_3 with four pale spots, m_1 with two pale areas, the distal one far from wing margin (Santarém et al. 2015).

Distribution: Brazil (Amazonas and Roraima).

Subgenus unplaced, *stigmalis* species group

Culicoides fluviatilis (Lutz, 1914)
(Figure 9)

Johannseniella fluviatilis Lutz (1914): 82. Amazonas, Brazil.
Culicoides scorzai Ortíz (1956): 93. Venezuela.

Identification: A large species; wing length 1.12 mm, membrane with evenly scattered, small but distinct, spinelike macrotrichia; CR 0.70; AR 0.80 (Felippe-Bauer and Wirth 1987).

Distribution: Colombia, Venezuela, Trinidad Ecuador, Bolivia, and Brazil (Amazonas).

Miscellaneous unplaced species

Culicoides wokei Fox, 1947
(Figure 9)

Culicoides wokei Fox (1947): 90. Panama.
Culicoides aethionotus Wirth and Blanton, (1955b): 121. Panama.

Identification: Eyes narrowly separated, bare; third palpal segment short and swollen, with broad, shallow sensory pit; second radial cell dark, pale spot over r-m crossvein very broad, cell r_3 with three pale spots, a small one at end of second radial cell, an elongate one behind second radial cell sometimes narrowly meeting the pale spot over crossvein and the anterior poststigmatic pale spot, and the third pale spot extensive, nearly filling apex of cell r_3; spermathecae two (Wirth and Blanton 1959).

Distribution: Costa Rica, Panama, and Brazil (Amazonas).

DISCUSSION

The richness of *Culicoides* in the state of Amazonas is 6.6% of all species of the genus worldwide and 77% all *Culicoides* species in Brazil (Borkent 2015; Farias et al. 2016; Santarém and Felippe-Bauer 2016). Catalogs and lists of species are important tools in the study of biodiversity of localities, states, countries, and zoogeographic regions (Santarém and Felippe-Bauer 2016). Our list of species may be helpful in identifying the *Culicoides* fauna of Amazonas, for it gathers together data on the identification and distribution of species occurring in the state. Moreover, we extend the ranges of nine species to the state of Amazonas, including two species are recorded from Brazil for the first time.

Despite the importance *Culicoides* to human health, the *Culicoides* fauna of Amazonas state is still poorly known. Our list of *Culicoides* of Amazonas adds to the knowledge of the diversity of this genus and may be useful for medical entomology, vector epidemiology, and management of these pernicious insects.

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